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## EBOOK - VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 1. PARTS 91 ADMINISTRATION**

##### **Section 1. Balloon Operations**

**4.1.1.1. GENERAL.** This section provides information to the aviation safety inspector (Inspector) concerning commercial and non-commercial balloon operations, when reviewing an application for a certificate of waiver or authorization for an aviation event that involves balloon operations, and when performing surveillance of balloon operations. It also includes safety considerations from the balloon industry. Additional guidance concerning balloon competitions and meets is located in the General Authority of Civil Aviation (GACA) eBook Volume 11, Chapter 2: Issue a Certificate of Waiver or Authorization for a Special Aviation Event.

**A. Regulatory Compliance.** Manned balloons are a class of the lighter-than-air category of aircraft, and are operated under General Authority of Civil Aviation Regulation (GACAR) Part 91. Unmanned moored balloons and unmanned free balloons are governed by GACAR Part 101. Manned balloons are maintained under GACAR Part 43. Operators of manned balloons operated commercially (e.g. sightseeing flights) must be certificated under GACAR Part 119 and operated under GACAR Part 135. Balloon pilots are certificated under GACAR Part 61. For the purposes of balloon operations in the Kingdom of Saudi Arabia (KSA), when a balloon is secured to the ground or to a fixed object by lines which prohibit free flight, it will be referred to as a “moored” balloon secured by “mooring lines”.

**B. Safety Considerations.** The following safety considerations should be observed during balloon operations.

- 1) When surface winds exceed 7 knots, the potential hazards with balloon launch procedures increase dramatically with the increase of wind speed.
- 2) Balloon pilots should consider existing and forecast wind directions and velocities when selecting launch sites. If there are trees or obstructions downwind the pilot should ensure that there are adequate distances to permit the balloon to climb above them.

NOTE: Extreme caution (including termination of flight) must be used anytime balloon operations are contemplated close to or upwind of high tension wires.

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- 3) Before takeoff the pilot should ensure that the ground crew is thoroughly briefed as to their duties during the planned flight.
- 4) Balloon pilots must select appropriate launch and landing sites. Under light or calm wind conditions, these sites might be quite small.
- 5) The pilot should ensure that existing and forecast weather conditions are suitable for the planned operations.
- 6) The pilot should always be aware of the possibility of becoming becalmed (unable to drift because of lack of wind) over areas offering limited appropriate landing sites. If groundspeed slows, the pilot should consider landing before drifting over those areas.
- 7) Balloon pilots must be aware of the potential hazards of operating in areas of wind shear. These potential hazards include abrupt changes in ground speed and/or direction during takeoff or landing, changes in the shape, size, and flight characteristics, even closure of the mouth of the balloon in flight when shear exceeds 15 knots. Balloon pilots must take precautions to avoid wake turbulence and rotor wash of large aircraft.

**C. Minimum Safe Altitudes.** GACAR § 91.67(a), (b), and (c) apply to all free balloon operations. Except when necessary for takeoff or landing, a balloon may not be operated below an altitude that would permit an emergency landing without undue hazard to persons or property on the surface.

**D. Powered Civil Aircraft Equipment and Instrument Requirements.** As used in the GACARs, the term “powered” refers to aircraft with horizontal propulsion systems. Under GACAR Part 1, balloons are considered lighter-than-air aircraft and are not considered powered aircraft. As a result, the minimum equipment and instruments required for hot air and gas balloons are prescribed in the airworthiness standard identified in GACAR Part 31.

**4.1.1.3. UNMANNED BALLOONS.** An unmanned balloon is a balloon that does not carry a person, even though it may be capable of carrying a crew and passengers. Unmanned moored and unmanned free balloon operations must be conducted in accordance with GACAR Part 101.

**A. Unmanned Moored Balloons.** An unmanned moored balloon is a balloon that is secured to the earth by several mooring lines and does not carry a person. The mooring lines prevent the balloon from swinging in the wind and keep it in a stationary position (Figure 4.1.1.1).

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**B. Unmanned Free Balloons.** An unmanned free balloon is not secured to the earth, is controlled or monitored from the ground during flight, and does not carry a person.

### C. GACAR Part 101.

- 1) GACAR Part 101 applies only to unmanned (moored and free) balloons. GACAR Part 101 does not apply to hot air or gas balloons (aircraft) that are occupied by passengers and crew. All manned balloons must be operated under GACAR Part 91.
- 2) There are no airworthiness standards for unmanned balloons because carriage of passengers aloft is not intended.
- 3) GACAR § 101.29 requires an automatic (2) rapid deflation device on a moored balloon to protect airspace users from a moored balloon that separates from its moorings. An automatic deflation device operates independently of any human input. It must be designed to deflate the envelope if a balloon separates from the mooring.

#### 4.1.1.5. MANNED BALLOONS.

**A. Manned Balloon Considerations.** Manned balloons, whether moored or free flight, are considered aircraft and must be operated in compliance with all the operating, certification, and airworthiness regulations applicable to aircraft.

### B. Operational Considerations.

- 1) When not in total free flight, a manned, moored balloon is limited by its mooring lines (normally three) that allow the balloon a radius of movement around the points of anchor (Figure 4.1.1.2). The size of this radius of action depends on the length of the mooring lines and the strength of the wind.
- 2) Operation of a manned, moored balloon requires essentially the same vertical control skills as those required to operate a free balloon.
- 3) A balloon on long mooring lines (over 50 m) may create a collision hazard between other aircraft and the mooring lines. For night operations, consideration should be given to providing lighted mooring lines. Where local air traffic service (ATS) service is available, the operator should advise the ATS facility of the presence of the mooring lines and balloon.

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4) When a balloon is moored in Class D airspace, the operator must advise the appropriate ATS facility of the balloon operation.

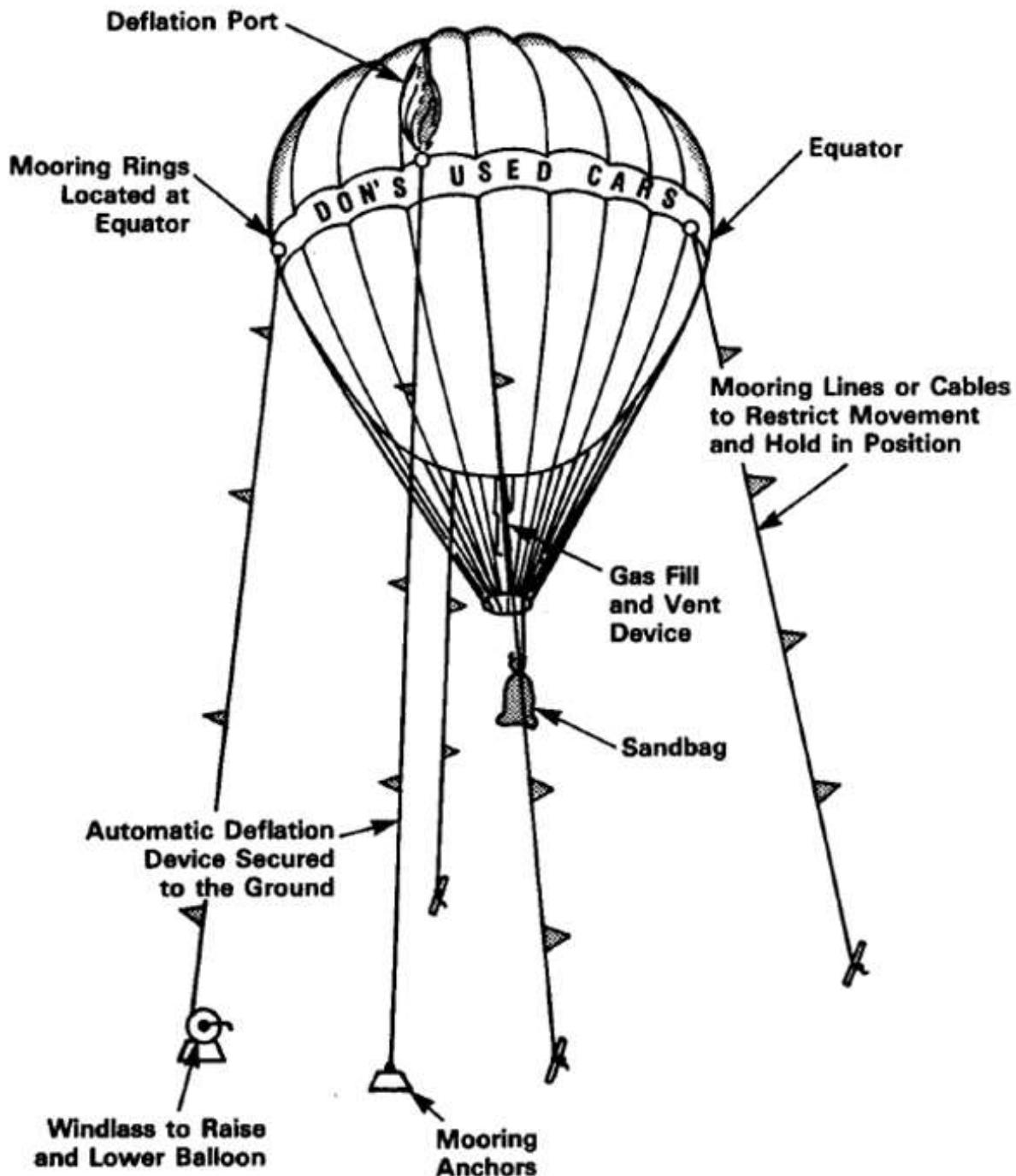
**C. Bungee Jumping.** Manned, moored balloons used for the purpose of bungee jumping must meet all appropriate operational requirements of GACAR Parts 61 and 91, must be certificated in accordance with GACAR Part 21, and must be maintained in accordance with GACAR Parts 43 and 91. Balloons that have been modified must have a design approval in accordance with the requirements of GACAR Part 21 for the modifications.

**4.1.1.7. GAS BALLOONS.** Gas balloons are regulated in the same manner as hot air balloons. However, certification of gas balloon pilots is a unique situation. At present there are no practical test standards (PTS) for initial certification of gas balloon pilots. Inspectors who conduct initial practical tests for free balloon (gas) pilots should use the applicable portions of the free balloon (with airborne heater) PTS, which are those tasks in the Free Balloon (with airborne heater) PTS that are common to both hot air and gas balloons. Refer to GACAR Part 61 for training, testing, and certification requirements for balloon pilots.

**4.1.1.9 BALLOON SURVEILLANCE.** Guidance for Inspector surveillance of balloon operations, whether commercial, non-commercial, or as part of an aviation event, is contained in the GACA eBook Volume 12, Surveillance, specifically but not limited to Chapters 1, 2, 3, 5, 9, and 15.

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Figure 4.1.1.1. Unmanned Moored Balloon



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**NOTE:** This balloon's operation is subject to GACAR Part 101.

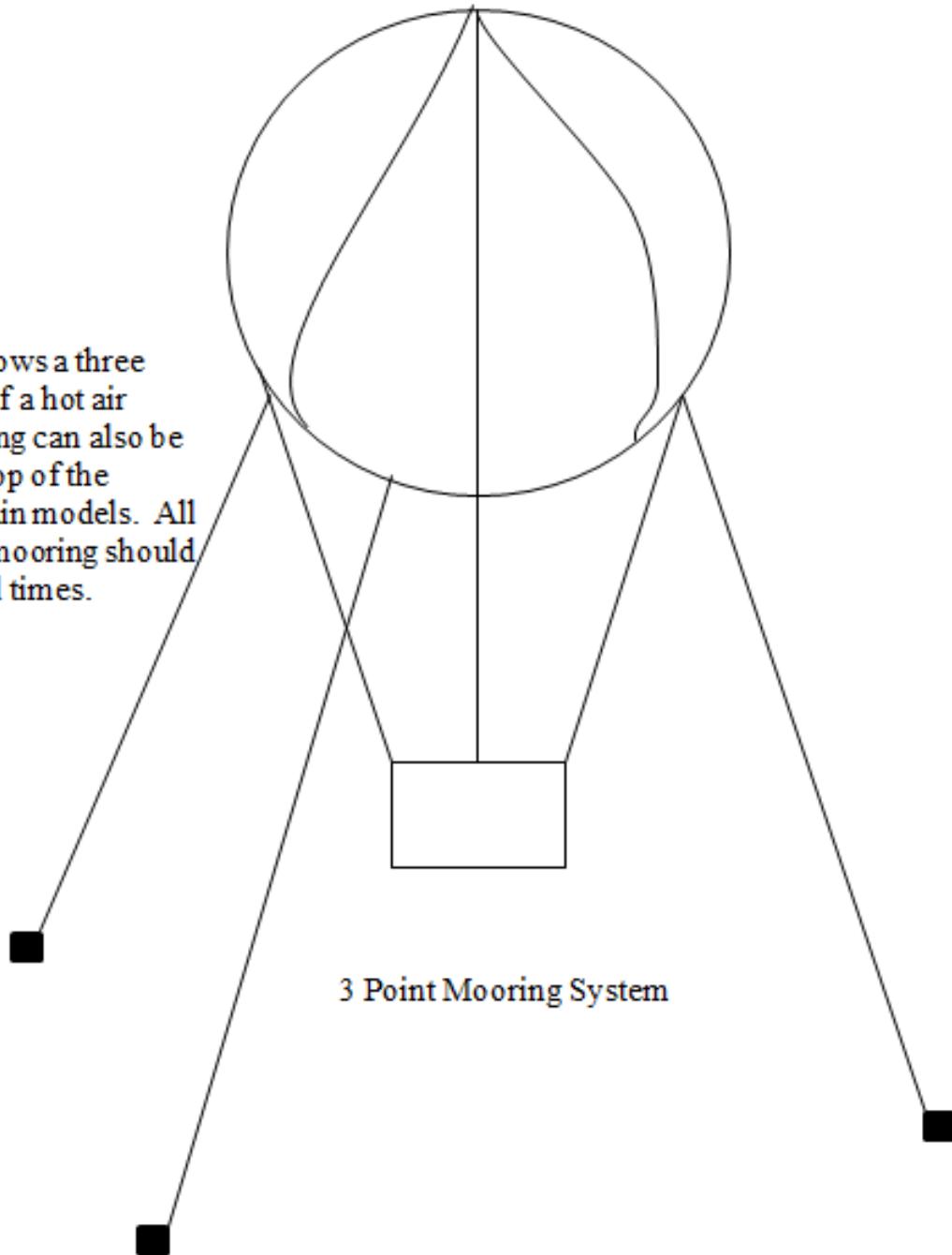
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**Figure 4.1.1.2. Manned Moored Balloon**

The diagram shows a three point mooring of a hot air balloon. Mooring can also be done from the top of the balloon on certain models. All three points of mooring should be manned at all times.



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**NOTE:** This manned, moored balloon's operation is subject to GACAR Part 61, 43 and 9, as appropriate.

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## CHAPTER 1. PARTS 91 ADMINISTRATION

### Section 2. Major Event Planning

#### 4.1.2.1. GACA ACTIVITY REPORT (GAR).

- A. 1942 (OP) (Major Event – Safety Support)

**4.1.2.3. OBJECTIVE.** This section provides information pertaining to the acceptable methods for organizing the aviation community for major events, such as major sports events (football matches, auto racing, golf, etc.). It is not limited to sporting events, but can be used whenever there is a large amount of aviation activity on an infrequent basis with an open gathering of people. The goal of this task is to enhance air and ground safety.

**NOTE:** This task does not include guidance for Special Aviation Events that require a General Authority of Civil Aviation (GACA) Certificate of Waiver or Authorization under GACAR Part 91.

#### 4.1.2.5. GENERAL.

A. The GACA realizes that there are certain public events that attract large numbers of aircraft to one location (e.g. the Olympic Games or World Cup Football matches). Therefore, a generic aviation plan is necessary to provide the safest environment possible for such events. Safety was the driving force behind the development process for this task. A major event can be either a great success, or end in tragedy. Therefore, detailed planning is required. Using the resources and experience of local resources, GACA aviation safety inspectors (Inspectors), and Air Traffic Service (ATS) personnel will enhance safety and should not impede operations or commerce surrounding the event.

B. The planning process begins with a determination of which phase is applicable to the event. The processes for the event can be divided into four phases: Planning, Implementation, Review, and Re-Engineering. Each phase is important and requires the organizers to tailor each one of the phases for their event, as each event is different.

#### 4.1.2.7. PLANNING. The planning phase begins in conjunction with the decision to hold an event.

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It is also the best time for GACA Inspectors and ATS facilities to contact the Event Organizing Officials. A determination can be made regarding the requirements for aviation support in anticipation of extra activities. It is better to overestimate aviation activities than be caught by surprise, especially for the first planned event. Afterwards, the ability to successfully plan succeeding events improves with experience.

**A.** Event organizers should consider making arrangements with the following organizations:

- 1) It is important for local emergency services (fire, medical, etc.), law enforcement agencies, and local transit or transportation authorities to be involved during the early planning stages. Each agency will bring unique experiences and resources to assist with the event. Plans should be made for emergencies on and off the event site, including plans for multiple casualties.
- 2) The managers of any local aerodromes that may be involved should be invited to the planning, since they will have direct knowledge of the local aviation facilities and operators as well as the level of involvement each may have during the event. Ensure that a ground safety plan has been developed for the aerodromes and landing areas. The plan should address parking and refueling of aircraft and the safe passage of passengers/pilots walking on the ramp area.
- 3) Important allies to aviation safety that should be included in the planning phase are the event liability insurance representative and insurance risk manager. The insurance representative can provide guidance regarding the terms of the event insurance coverage and the risk manager can assure compliance with those terms. The insurance companies have a vested interest that the event operates safely.
- 4) The event organizers will decide if there is a necessity to contract out certain functions, for example, heliport operations, aircraft fuelers, and transportation (e.g., buses). If it is necessary to use contractors, they should be included in the planning phase.
- 5) The event organizers might consider the use of any volunteer groups which normally support either the primary event type or aviation events in general. These groups can assist in security, ground handling, and safety escorts on the flight line, etc.

**B.** The event plan should cover issues that occur before, during, and after the event. Each segment has different requirements that require consideration. Prior to the event, the plan might cover

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mass migration of aircraft to one, maybe two, aerodrome(s). During the event, the plan should cover the operation of rotorcraft, banner towing aircraft, airships, and balloons over and in the vicinity of the event site. After the event, the plan should prepare for the mass exodus from the event site and aerodromes.

**C.** The importance of in-depth planning cannot be overemphasized. The planning efforts will be rewarded when the spectators enjoy the event in a safe environment.

**4.1.2.9. IMPLEMENTATION.** This phase begins when the event plans are put into action. It may begin days or even months prior to the event. An important aspect of implementing the plan is to be flexible. Even the best-laid plans are usually modified at some point. The event organizers must be empowered to make minor on-the-spot changes that will increase efficiency and not compromise safety. When changes develop, the event organizers should ensure that the changes are communicated to the GACA and to all parties concerned. It is recommended that all key people keep a list of problems that were encountered for future reference. Lessons learned through after-event reviews often improve the level of safety for future events.

**A.** The GACA can assist the organizers with GACA presence during the implementation phase. (Since many events are on private property, ensure that the landowner gives permission, and if necessary obtain credentials for GACA personnel to operate on site.) Experience has shown that GACA presence will significantly reduce the chances of blatant disregard for aviation safety.

**B.** Implementing a plan will require the event organizers to be available throughout the event. Consider the use of a network of cellular telephones or two-way radios to accomplish this and, if possible, GACA representatives should have access to this communication network.

**4.1.2.11. REVIEW.** This phase is very important to the organizers of recurring events. Also, if the lessons learned are shared, they will benefit others who follow with similar types of events.

**A.** The key to the review is for everyone involved to provide feedback. The key personnel should feel compelled to give honest, in-depth feedback. It is a good idea to solicit comments from those outside the planning team, such as pilots, bus drivers, and spectators. This could be accomplished with either a formal or informal survey.

**B.** While positive notes are likely to be briefer, they are also important. If something really worked well, then it should not be compromised needlessly while correcting a different problem. The comments should be documented, if possible as a group, and brainstorm possible solutions

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to problems that have been identified. Documentation will increase the potential for success in future events and leads directly to the next phase.

### **4.1.2.13. RE-ENGINEERING.**

**A.** This phase can impact all future events. By evaluating the event plans and making the best changes from the review, the organizers can begin developing the plans for the next event. This should not be delayed. Completion of this phase while it is still relatively fresh on the minds of all key people is crucial to system enhancement.

**B.** This phase should lead into the planning phase for your next event. Approach the next planning phase with the knowledge of past events, but resist complacency in regarding the future. Each event has the potential for a mishap. A successful event will continue to grow as long as the safety of spectators and aviation participants is a first priority.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 1. PARTS 91 ADMINISTRATION**

##### **Section 3. Evaluating and Inspecting Part 91 Aircraft**

###### **4.1.3.1. GACA ACTIVITY REPORT (GAR).**

- A. 3425 (AW) (Initial Progressive Inspection)
- B. 3426 (AW) (Revision-Progressive Inspection)
- C. 3427 (AW) (Equipment-Approval Cat I)
- D. 3428 (AW) (Initial-Inspection Program Turbine)
- E. 3429 (AW) (Revision-Inspection Program Turbine)

**4.1.3.3. OBJECTIVE.** This section discusses the procedures to monitor aircraft and approved Aircraft Inspection Programs (AIP) under General Authority of Civil Aviation Regulations (GACAR) Part 91.

**4.1.3.5. INSPECTION PROGRAMS.** Several types of inspection programs are available to GACAR Part 91 owner/operators:

**A. Annual and 100-Hour Inspections.** The annual and 100-hour inspections are identical in scope and detail. The only difference is in the performance and approval of the annual inspection, which must be accomplished by a person authorized under GACAR §§ 43.5 and 43.9, as provided in GACAR Part 66.

- 1) GACAR § 43.15 requires persons approving or disapproving equipment for return to service after any required inspection to make an entry in the record of that equipment. An approved repair station documenting compliance with an annual inspection in the aircraft maintenance records meets the requirements of GACAR § 43.5.
  - a) An owner/operator maintaining separate records for the aircraft, airframe, aircraft engine, propeller, appliance, or component parts will make the entry for both the annual

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inspection and the 100-hour inspection in the aircraft maintenance record. (GACAR § 91.457, and § 43.15.)

b) An owner/operator shall ensure that maintenance personnel make appropriate entries in the records for the aircraft, airframe, aircraft engine, propeller, appliance, or component part. Owners/operators keeping the required records together in a single record will make the entry of the annual inspection in that record. The entries for 100-hour inspections and other maintenance also will be made in this record, as required by GACAR § 91.457.

2) *Annual Inspections.* GACAR § 91.449(a) requires that any person who operates aircraft must ensure that the aircraft has documenting compliance with an annual inspection in the aircraft maintenance records meets the requirements of GACAR Part 43.

a) Annual inspections are designed to provide a complete and comprehensive inspection of an aircraft. They are performed at least each 12 calendar-months. The inspection determines the condition of the aircraft and the maintenance required to return the aircraft to an airworthy condition. Appendix C of GACAR Part 43 defines the scope and detail of an annual inspection.

b) The owner/operator of an aircraft may have annual inspections at any interval that does not exceed the maximum of 12 calendar-months between inspections, as specified by GACAR § 91.449(a)(1). For example, an aircraft inspected and approved upon any day of a calendar-month will become due for inspection upon the last day of the same month, 12 months later.

c) GACAR Part 43, Appendix C provide that all systems, components, and appliances shall be checked to ensure proper installation and satisfactory operation.

1. Before conducting surveillance of annual inspections performed by maintenance personnel, aviation safety inspectors (Inspectors) should become familiar with the manufacturer's recommended inspection procedures, special instructions, etc.
2. Inspectors also should know the acceptable degree of deterioration or defect permitted by the manufacturer, as set forth in the manufacturer's manuals or other data.

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d) In all cases, persons authorized to perform inspections under GACAR § 43.9 must determine from records and physical inspection that the aircraft conforms to the contents of the following:

- Approved type design for the aircraft as specified in:
- Type certificate data sheets (TCDS)
- Supplemental Type Certificates (STC), if applicable
- Airworthiness Directives (AD)

e) The above documents must be available to the maintenance personnel conducting an inspection. Applicability of an STC may be determined by reference to the aircraft maintenance records.

f) The inspection is not considered complete until the required recording procedures of GACAR §§ 43.15 and 91.457 are met.

1. Under the provisions of GACAR § 43.15, the agency or person approving or disapproving for return to service is responsible for recording the inspection in the maintenance records.

2. If the person conducting the inspection finds the aircraft to be un-airworthy, appropriate entries must be made in the aircraft maintenance records. The owner/operator must be provided a list of discrepancies or un-airworthy items.

3. The owner/operator must ensure that the maintenance records contain proper entries according to GACAR § 91.457. The owner/operator must have discrepancies found during the inspection repaired, as prescribed in GACAR Part 43, before the aircraft is returned to service.

g) When conducting surveillance, Inspectors (Airworthiness) will review aircraft maintenance records to determine if the requirements of an annual inspection have been accomplished.

3) *The 100-Hour Inspection.* Appendix C of GACAR Part 43 defines the scope and detail of

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a 100-hour inspection. 100-hour inspections are required, in addition to annual inspections, under the following situations:

- Aircraft are operated for carrying persons for compensation or hire
- Aircraft are used for flight instruction for hire

**NOTE:** When a flight instructor is not included in the rental agreement, a 100-hour inspection is not required on an aircraft when it is rented out.

**B. Progressive Inspections.** The progressive inspection must be a complete inspection of the aircraft, conducted in stages, with all stages to be completed in a period of 12 calendar-months.

- 1) An owner/operator desiring to use a progressive inspection program must submit a written request to the General Authority of Civil Aviation (GACA).
  - a) The owner/operator may develop a progressive inspection program tailored to fit the operation.
  - b) Progressive inspection programs developed by the manufacturer do not automatically fit the needs of each individual operator; Inspectors must review them on a case-by-case basis.
  - c) The owner/operator's progressive inspection program may be more restrictive than the manufacturer's program, but it may not be less restrictive unless sufficient justification is presented to and accepted by the GACA.
- 2) The aviation safety inspector (Inspector) should not attempt to establish for the owner/operator arbitrary intervals for the inspection or overhaul of aircraft. Intervals should be based on the manufacturer's recommendations, field service experience, malfunction and defect history, and the type of operation in which the aircraft is engaged.
- 3) If the progressive inspection is discontinued, the owner or operator shall notify the GACA in writing immediately. After the discontinuance, the first annual inspection is due within 12 calendar-months after the complete inspection has been accomplished according to the progressive inspection program.

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**C. Turbine Powered Multiengine Airplanes and Turbine Powered Rotorcraft (that were certificated in other than the transport or commuter categories) Inspection Programs.** These aircraft must be inspected according to the requirements of an inspection program selected by the owner/operator. GACAR § 91.449(f) outlines various options available to the owner/operator.

- 1) It may appear that some of the options specified in GACAR § 91.449(f)(1) through (3) do not involve the GACA Inspector, as they refer to previously approved and manufacturer-recommended programs. However, Inspectors must recognize that these programs must be either currently recommended by the manufacturer or currently in use by GACAR Part 121 125, or 135 operators who are supplying the program. The intent of this requirement is to prevent the use of obsolete programs.
- 2) Reference to a manufacturer-recommended program has led to several misconceptions about what precisely constitutes such a program.
  - a) GACAR § 91.449(f)(2) refers to “Inspection programs currently recommended by the manufacturer.” No reference is made to the aircraft manufacturer specifically. GACAR § 91.449, however, requires inspection of the airframe, engines, propellers, appliances, survival equipment, and emergency equipment.
  - b) Therefore, a complete manufacturer’s recommended program consists of the program supplied by the airframe manufacturer and supplemented by the inspection programs provided by the manufacturers of the engines, propellers, appliances, survival equipment, and emergency equipment installed on the aircraft.

**NOTE:** Because this program addresses inspections only, it does not include Service Bulletins (SB), Service Letters (SL), service instructions, and other maintenance documents, unless they require an inspection to be performed.

**D. Approved Aircraft Inspection Programs (AAIP) (GACAR §§ 91.449 and 91.455).**  
GACAR Part 91 addresses the use of an AAIP in three sections.

- 1) GACAR § 91.449(f) states that the owner/operator must select, identify, and use one of the inspection programs. Section 91.449(f) presents as one of the options “an approved aircraft inspection program approved under § 135.419...and currently in use by a person holding an air operating certificate issued under Part 135.”

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2) GACAR § 91.449(g) states “Each operator of an airplane or turbine-powered rotorcraft desiring to establish or change an approved aircraft inspection program under paragraph (f)(3) of this section must submit the program for approval to the GACA.”

3) GACAR § 91.455(a) states “Whenever the President finds that revisions to an approved aircraft inspection program under § 91.449(f)(3) are necessary for the continued adequacy of the program, the owner or operator shall, after notification by the President, make any changes in the program found to be necessary by the President.”

**E. Manufacturers’ Inspection Programs.** These programs may be included in the Aircraft Maintenance Manuals or offered by the manufacturer separately. Typically, they are designed to provide the owner/operation with a degree of scheduling flexibility and a minimum of downtime. Inspectors should carefully review these programs as they may not cover items such as avionics, emergency equipment, or equipment installed by a person other than the manufacturer.

**4.1.3.7. COMPUTERIZED RECORDKEEPING AND ALERTING PROGRAMS.** Computer companies have made available software designed to function as maintenance tracking programs. For guidance on this subject, see Federal Aviation Administration (FAA), Advisory Circular (AC) 120-78 (as amended), Acceptance and Use of Electronic Signatures, Electronic Recordkeeping Systems, and Electronic Manuals.

### **4.1.3.9. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Parts 39, 43 and 91
- Federal Aviation Administration (FAA) AC 43-9 (as amended), Maintenance Records.
- FAA AC 43 16 (as amended), General Aviation Maintenance Alerts.
- FAA AC 120 78 (as amended), Acceptance and use of Electronic Signatures, Electronic Recordkeeping Systems, and Electronic Manuals.

#### **B. Forms. GAR.**

#### **C. Job Aids.** None.

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### **4.1.3.11. PROCEDURES.**

#### **A. Review and Accept a Progressive Inspection Program.**

- 1) Advise the owner/operator desiring a progressive inspection program to submit a letter of intent (LOI) and a copy of the program, as required by GACAR § 91.449(d).

**NOTE:** The inspector should carefully review GACAR § 91.449(d) prior to analysis of the program.

- 2) Upon receipt of the LOI and the program, ensure the following:
  - a) The program includes the entire aircraft and its components.
  - b) The program will provide a complete inspection of the aircraft within 12 calendar-months. Inspection intervals should be based on the manufacturer's recommendations, field service experience, malfunction or defect history, and the type of operation in which the aircraft is engaged.
  - c) The scope of the inspection equals that of an annual-type inspection.
  - d) The progressive inspection schedule ensures that the aircraft at all times will be airworthy and will conform to all applicable aircraft specifications, TCDS, ADs, and other approved data.
  - e) The program includes procedures for the immediate, written notification to the GACA upon the discontinuance of the progressive program and the assumption of an annual inspection program.
- 3) Analyze results of the review.
- 4) Notify the operator in writing of any deficiencies found in the program.
  - a) Request that the operator inform the GACA of plans for resolving deficient items.
  - b) Once deficiencies have been corrected to meet the requirements of GACAR § 91.449, notify the operator in writing that the program has been accepted.

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5) Establish and maintain an operator file according to GACA procedures. The file should include a copy of the program and all related correspondence.

### **B. Approve an Aircraft Inspection Program under GACAR § 91.449(g).**

1) Advise the operator of an airplane or turbine-powered rotorcraft desiring an approved aircraft inspection program to submit the program for approval to the GACA.

2) Ensure the program is in writing and details the following:

- Instructions and procedures for conducting inspections, including necessary tests and checks
- Inspection intervals, expressed in terms of time in service, calendar time, number of system operations, or any combination of these
- The parts and areas that must be inspected

3) Compare the submitted program with the manufacturer's recommended program. Ensure that the applicant completely justifies all deletions of items and inspection period escalations. Where there is no manufacturer's recommended program, use a time-tested program for comparison purposes.

4) Ensure that the program developed by the applicant provides a level of safety equivalent to or greater than that provided by the inspection options of GACAR § 91.449(f)(1) through (3).

5) Indicate approval on the cover page of the aircraft inspection program. Include the date of approval, the inspector's signature, and the office name, number, and location. Stamp the list of effective pages with the office stamp, date, and the signature of the inspector.

**C. Review Maintenance Records.** Ensure that persons approving and disapproving equipment for return to service after any required inspection have entered the inspection in the record of that equipment. Verify that when an owner/operator maintains a single record, the entry for required inspections is made in that record. Ensure that if the owner/operator maintains separate records for the airframe, engines, powerplants, propellers, appliances, and components, the entry for required inspections is made in each.

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- 1) For an annual/100-hour inspection, review records to ensure compliance with the requirements of GACAR §§ 43.15 and 91.457. Determine that appropriate entries have been made to meet the regulatory requirements.
- 2) For a progressive inspection, ensure that records indicate the following:
  - Completion of an annual inspection within the past 30 days prior to the start of inspections under a progressive inspection program
  - Compliance with inspection intervals prescribed in the progressive program
  - Completion of the inspection cycle within 12 calendar-months
- 3) For turbine-powered multiengine airplanes and turbine-powered rotorcraft inspection programs, ensure the maintenance records indicate that the owner/operator has identified and is using a selected program according to GACAR § 91.449(f). For any inspection program with a computerized recordkeeping and alerting system, see Volume 4, Chapter 11, Section 4, Electronic Recordkeeping for guidance on approval of such systems.

### **4.1.3.13. TASK OUTCOMES.**

#### **A. Complete the GAR Record.**

**B. Complete the Task.** Successful completion of the task will result in acceptance and/or approval of the inspection programs.

**4.1.3.15. FUTURE ACTIVITIES.** Carefully monitor inspection systems for compliance with appropriate GACARs and for continued airworthiness of subject aircraft. Determine whether maintenance practices are performed at an adequate level of safety. Direct particular attention to any areas where trends indicate a faulty inspection system or inadequate maintenance. Take immediate action to correct any deficiencies.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 2. EXEMPTIONS, WAIVERS AND AUTHORIZATIONS**

##### **Section 1. Exemptions**

###### **4.2.1.1. GACA ACTIVITY REPORT (GAR).**

A. (TBD)

**4.2.1.3. GENERAL EXEMPTION GUIDANCE.** The granting of an exemption is generally viewed as an alternative method of complying with a regulatory requirement. The legislation governing civil aviation in Saudi Arabia is the Civil Aviation Act. Article 5 of the Act which has vested the authority for administering this legislation onto the General Authority of Civil Aviation (GACA), which is governed by a Board of Directors. The Board of Directors of GACA delegates to the President the responsibility for regulatory policy in the sectors of civil aviation. In order to ensure the orderly and safe development of aviation in the Kingdom of Saudi Arabia (KSA), operational regulations have been imposed on virtually all aviation activities. These regulations are known as the General Authority of Civil Aviation Regulations (GACARs). Exemptions to the GACARs are governed by procedures prescribed in GACAR Part 11. A grant of exemption and each specific condition and limitation of the exemption is a regulatory requirement.

###### **4.2.1.5. THE REGULATORY EXEMPTION PROCESS.**

A. It has long been recognized that, in certain situations governed by law, there may be occasions when a regulation cannot or ought not to apply. In such cases, it may be appropriate to issue an "exemption" which exempts compliance from all or part of the regulatory requirement. In the KSA, regulatory exemptions to civil aviation regulatory requirements are dealt with using two different approaches:

1) In the first approach the Civil Aviation Act specifically permits exemptions to regulatory requirements in certain specified circumstances. Articles 10(2) and 81(3) are examples of this approach in that specific aircraft requirements can be exempted for aircraft engaged in technical tests, teaching or training.

2) In the second approach, the provisions of Article 16(17) of the Civil Aviation Act, which permit the GACA to issue government orders necessary to exercise the powers of the Act, are

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utilized. In this case the GACA has issued orders that permit the exemption of regulatory requirements in specific circumstances provided that two principles are respected:

- Specific restrictions or conditions are imposed that will provide for an acceptable level of safety
- The exemption is in the best interest of the Kingdom of Saudi Arabia

**B.** It must be borne in mind, however, that it is a fundamental requirement of the Saudi Arabian legal system that legislative enactments will be applied universally and governs all members of the affected public equally. This enables each person to know what is required and to act with the expectation that all persons to whom the law or order applies will be obeying the known requirements of that law or order. For this reason, exemptions to regulatory requirements using this second approach must only be granted in exceptional circumstances and when the principles of fairness, transparency and public safety are respected.

**C. Phase One - Petition for Exemption.** In general, regulatory exemptions must begin with a petition from a person who seeks the regulatory exemption. A petition for exemption must be submitted in writing to the President using a Petition for Regulatory Exemption. The petition must include the following items:

- Identification of who needs the exemption
- Identification of the regulation(s) that an exemption is requested from including the extent of the relief sought
- The reason that the exemption is required
- Justification for the exemption including the identification of compensating features or factors that will provide for an acceptable level of safety
- The date the exemption is required by
- The required duration of the exemption
- If the petitioner wants to exercise the privileges of your exemption outside the Kingdom of Saudi Arabia, the reason(s) why this is needed

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NOTE: GACA Circular No. R-7-2009 has been published which informs all petitioners for regulatory exemptions what they must do, which form they must use and who the petition must be sent to.

**D. Phase Two - GACA Review and Assessment.** Exemptions are granted by the President only in exceptional circumstances and only after a thorough analysis is conducted on the impact the granting of the exemption may have on aviation safety. An acceptable level of safety is established through the development of restrictions and conditions that will provide alternate requirements or procedures to ensure any safety concerns are satisfied and safety is not compromised. In this regard, consideration should be given to any pending amendments to the regulation as well as the terms and conditions of previously issued exemptions. The test for assessing the merits of an exemption petition is two-fold. Each exemption must answer the following two questions positively or the exemption request must be denied:

- Have specific restrictions or conditions been imposed that will provide for an acceptable level of safety to account for the regulatory requirements that are being exempted?
- Is the exemption in the best interest of the KSA?
  - 1) Each question stands on its own and must be addressed independently. In other words, the results of the test must be that the exemption is *both* in the best interest of the Kingdom of Saudi Arabia and is not likely to adversely affect aviation safety.
  - 2) The analysis of the exemption request is made by a team of experts from the GACA Safety & Economic Regulation Sector. Ideally, the team shall be composed of experts in the subject area of the regulation(s) to be exempted. The assessment team shall summarize its analysis in an assessment report. The purpose of the assessment report is to summarize the case being put forward by the petitioner for an exemption and to justify the basis for the decision made by President to either grant, partially grant or deny the request. In this way, the official record will show that the delegated authority has been exercised in accordance with a disciplined process, having taken into consideration all of the relevant facts and policies on the case. In short, the assessment report will reflect GACA's consideration of the exemption request being made.
  - 3) The contents of the "Assessment Report" are essentially an answer to the arguments being presented by the party making the exemption request and must include the following headings:

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- a) Intent of Regulation(s): Explanation of the intent of the regulatory requirements for which the exemption is sought.
- b) Safety Analysis: Analysis to show whether the exemption is, or is not, likely to adversely affect aviation safety.
- c) Best Interests of the Kingdom of Saudi Arabia Analysis: Analysis to show whether the exemption is in the best interest of the Kingdom of Saudi Arabia. Factors to consider include the following:
  1. The consequence of the exemption being granted or denied considered in terms of the needs of or benefits to the aviation public and the local community; consequences which may be of commercial or practical convenience, or necessity of the operation.
  2. All factors that examine the economic impact on “non-exempt” operators given that an exemption must not result in any unjustified competitive advantage to one party over another.
  3. All factors that examine whether or not an exemption written against a foreign carrier will economically penalize another foreign carrier, or Saudi Arabian operator.
  4. Identification of any impact the exemption would have on international obligations or treaties.
  5. The record of regulatory compliance of the petitioner.
- d) Restrictions and Conditions: Identification of any restrictions or conditions that would be necessary to mitigate any potential risk resulting from regulatory requirements being exempt.
- e) Validity Period: Identification of any validity period that would be required to ensure the exemption would positively satisfy the safety and best interest of the Kingdom tests.

### **E. Phase Three - Final Decision (Grant, Partial Grant or Denial).** The final decision and

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authority to issue an exemption in the domain of aviation safety and economic regulation rests with the President. The final decision will be: grant, partial grant or deny. Many exemptions will be time limited and thus will contain a validity period. The final decision will be communicated to the petitioner by an official exemption document. An exemption is a legal document and must contain certain essential elements of both substance and form to ensure its legal validity. By virtue of the fact that the exemption removes a party from complying with the requirements of a particular regulation, the exemption then becomes the “new legal regime”. The document must stand on its own and withstand legal scrutiny should circumstances unfold that would place the exemption in the public eye, and/or necessitate its revocation by the Authority. To ensure that exemptions are granted in a consistent fashion at the GACA, the procedures for drafting exemptions documents as described below must be followed.

**4.2.1.7. PETITIONS FOR RULEMAKING OR EXEMPTIONS.** GACAR § 11.7(b), prescribes the regulatory basis for filing a petition for rulemaking and GACAR § 11.9 provides the regulatory basis for a petition for exemption from an existing rule. In addition, GACAR § 11.9 specifies the information that must be included in the petition for exemption.

**A. Who May Apply.** Any interested person may petition the President to issue, amend, or repeal a rule in accordance with the procedures issued by GACA. Any person may also request a temporary or permanent exemption from any rule issued by the President in accordance with the procedures issued by GACA and in compliance with the regulatory requirements found in GACAR § 11.9(b).

**B. Rules for Which Exemptions are Inappropriate.** Normally, exemptions are only issued in exceptional circumstances. The President does not issue exemptions from rules in which other authorizing documents are available to provide the requested relief from a requirement. There are two types of situations where requested relief can be granted without exemptions.

1) The first type is through the use of specific “relief” provisions contained directly in the rule language. In these situations the rule will say what relief is permitted and the conditions under which such relief would be permitted. When relief is granted under these provisions, a formal written authorization is always provided by the President. For example, paragraph (f) of GACAR § 121.225 Aircraft Proving and Validation Tests: Special Unscheduled Operations states that “The President may provide relief from this section if he finds that special circumstances make full compliance with this section unnecessary”. In this case a request for relief from the requirements for aircraft proving and validation tests may be

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authorized by the President without the need for an exemption. The requested relief would be authorized by way of operations specifications or other formal means such as a letter.

2) The second type is through the use of waivers. Waivers are only permitted for certain requirements that are specifically listed in GACAR § 91.611 - List of Rules Subject to Waivers. Section 2 of this chapter discusses waivers in more detail. When a rule is waved, a formal written authorization is always provided by the President in the form of a Certificate of Waiver. NOTE: No other requirements than those listed in GACAR § 91.611 may be waived with a Certificate of Waiver.

**C. Supporting Information.** Exemptions are issued only upon a finding that such action will be in the public interest. In providing the required supporting information, the petitioner should give particular attention to the reason why granting the request will be in the public interest.

### **4.2.1.9. CONTENT OF PETITION. Each petition for an exemption must contain the following:**

- Identification of who needs the exemption
- Identification of the regulation(s) that an exemption is requested from including the extent of the relief sought
- The reason that the exemption is required
- Justification for the exemption including the identification of compensation features or factors that will provide for an acceptable level of safety
- The date the exemption is required by
- The required duration of the exemption
- If the petitioner wants to exercise the privileges of its exemption outside the KSA, the reason(s) why this is needed
- Explain the reasons why granting the petitioner's request would be in the best interest of the KSA – that is, how would it benefit the public as a whole
- The action(s) to be taken by the petitioner to provide a level of safety equivalent to that

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provided by the rule from which exemption is sought or the reason why a grant of exemption would not adversely affect public safety

- Any additional information available to support petitioner's request

**4.2.1.11. PREPARATION AND SUBMISSION OF PETITION.** Each petition should be submitted to the President at least 120 days before the proposed effective date of the requested exemption. Serious consideration should be given to items listed in GACAR § 11.9(b) by the prospective petitioner before the petition is written. Frivolous or ill prepared petitions are rejected and both the petitioner's and the GACA resources are unproductively used in the rejection process. Petitions are frequently rejected because the petitioner failed to identify and explain the reasons why a grant of exemption would be in the public interest. The petitioner's interest is not necessarily considered to be in the "public interest." A petitioner's statement that a grant of exemption would be in the public interest because it would reduce the petitioner's operating costs is not acceptable and is a reason for the President's rejection of the petition. Each petition for exemption should be well conceived and in writing.

**4.2.1.13. PROCESSING THE PETITION.** At the discretion of the President a summary of the petition for exemption may be made available to the public and the public may submit comments. After the close of the public comment period, the President considers all comments received and decides whether to accept or deny the petition.

**4.2.1.15. GACA ANALYSIS.** Exemptions are granted by the President only in exceptional circumstances and only after a thorough analysis is conducted on the impact the granting of the exemption may have on civil aviation in the KSA.

**A.** The test for assessing the merits of a petition for exemption is two-fold. Each exemption must answer the following two questions positively:

- 1) Have specific restrictions or conditions been imposed that will provide for an acceptable level of safety to account for the regulatory requirements that are being exempted?
- 2) Is the exemption in the best interest of the KSA?

**B.** The GACA analysis is undertaken by a group of experts within the Safety & Economic Regulation Sector under the direction of the Vice President. The petitioner is reminded that their petition should include as much information as possible to assist the President in completing a

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comprehensive and accurate analysis of the petition. The GACA analysis takes time to complete and petitioners must not assume that they will receive a decision on their petition immediately after submitting it. See Figure 4.2.1.1, Exemption Work Flow Map for Inspectors for additional guidance.

**4.2.1.17. GRANT, PARTIAL GRANT or DENY.** The final decision and authority to issue an exemption is the domain of aviation safety and economic regulation rests with the President. The final decision will be: grant, partial grant or denial of exemption. The final decision will be communicated to the petitioner by an official exemption letter. An exemption cannot be used to compel a petitioner to do something the regulations themselves do not require. If, in the course of granting a petitioner relief from a regulation the exemption actually imposes more onerous conditions than the regulation itself, the petitioner always has the choice to not take advantage of the exemption. In this case, the petitioner is expected to comply fully with the existing regulations and standards. Note that if the petitioner of the exemption does not comply with its conditions, the exemption becomes null and void and the person must then comply fully with the regulations. NOTE: Certificate holders operating under GACAR Part 121, 125, 133, 135, 141, 142, 145 or 147 must be issued OpSpec A05 in order to authorize the use of the exemption.

**4.2.1.19. PETITION FOR RECONSIDERATION.** A petitioner who is denied an exemption may petition the President for reconsideration within 14 calendar days after the date of receiving the certification denial of exemption. The petitioner's request for reconsideration of its petition must be based on the existence of one or more of the following:

- A finding of a material fact that is erroneous
- When petitioner believes that the decision of the President was made incorrectly, unfairly or without the benefit of all available relevant information
- Any additional facts relevant to the decision, which was not presented in the initial petition for exemption. (The petition for reconsideration must state the reason the additional facts were not presented in the initial petition)

**4.2.1.21. THE APPEALS PROCEDURES.** The President is prepared to hear personal appeals during a meeting with appropriate representatives. During this meeting both written and oral presentations may be made subject to certain limitations, in order to ensure that the rights of all affected parties are respected while the President carries out its regulatory obligations.

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**4.2.1.23. PROCESSING A PETITION FOR RECONSIDERATION.** At the discretion of the President, the President may elect to establish a reasonable period for public comment that will be announced via GACA communication protocols.

**4.2.1.25. PUBLICATION OR IMMEDIATE PROCESS.** In either event (with or without public consultation) the President will appoint a review panel to consider the appeal. The appeal panel must consist of at least two managers and one technical specialist who were not involved with the original petition.

**4.2.1.27. MEETING WITH THE PETITIONER.**

**A. Scheduling.** The appeal panel should schedule any requested meeting with the appellant within 15 calendar days of receipt of the notice of appeal.

**B. Participants.** The appellant and his representatives and the appeal panel may attend the meeting. If the appellant chooses to have legal counsel attend the meeting, the appeal panel may arrange to have legal counsel from the GACA attend.

**C. Record.** GACA will keep a record of the meeting and send a copy of the meeting record to the petitioner within 15 days of the meeting. The appellant may send comments or proposed corrections.

**4.2.1.29. APPEAL DECISION.** The appeal panel will consider the evidence provided by the appellant and the GACA's records on the certification denial or compliance enforcement decision. The appeal panel will document its deliberations and rationale for its recommendation within 45 days of the date of appeal. The President will make the final decision of the appeal with consideration of the recommendation of the appeal panel. GACA will notify the appellant (by certified mail) of the final decision within 15 days after the President makes his decision. The decision may affirm, modify or reverse the initial decision. The notice must contain the following:

**A. Reasons for Decision.** The notice must state the decision and justification for it, including a response to the arguments presented by the appellant. If the certification denial or compliance enforcement decision is reversed or modified, the notice will state the effective date of the reversal, and any actions required on the appellant's part to resume or commence the performance of authorized functions.

**B. Right to Further Appeal.** The notice must state that the decision is final unless the appellant

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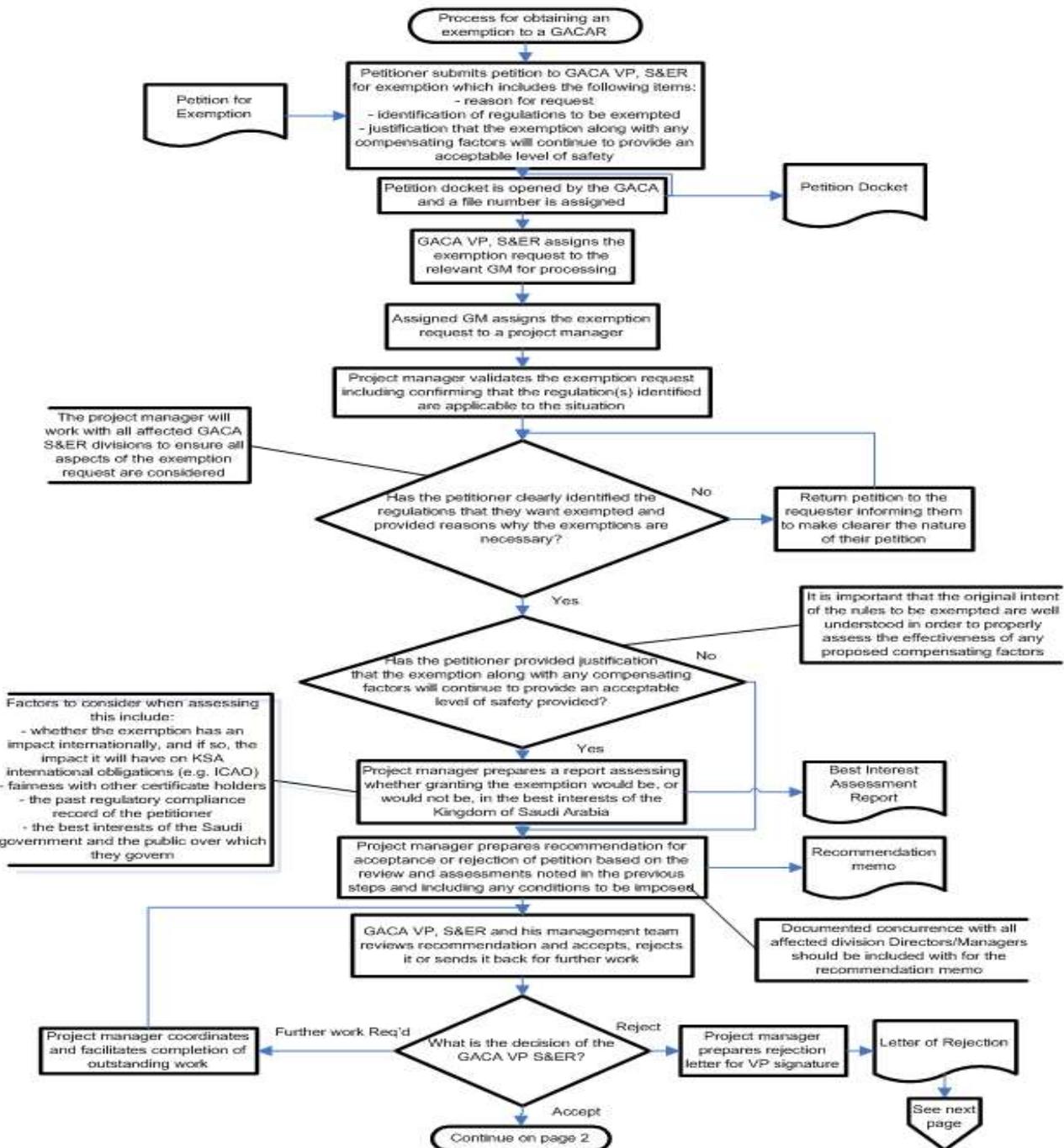
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petitions the Board of Directors of GACA in writing and they agree to hear a further appeal.

**4.2.1.31. ISSUE FINAL DECISION.** The panel will prepare the final decision documents for signature by the President. Regardless of whether a revised grant, partial grant or denial of reconsideration of exemption is issued, the document will be signed by the President delegated such authority and responsibility under GACAR § 11.3. Copies of the grant, partial grant, or denial of petition for reconsideration are mailed to the petitioner and placed in the electronic GACA archives.

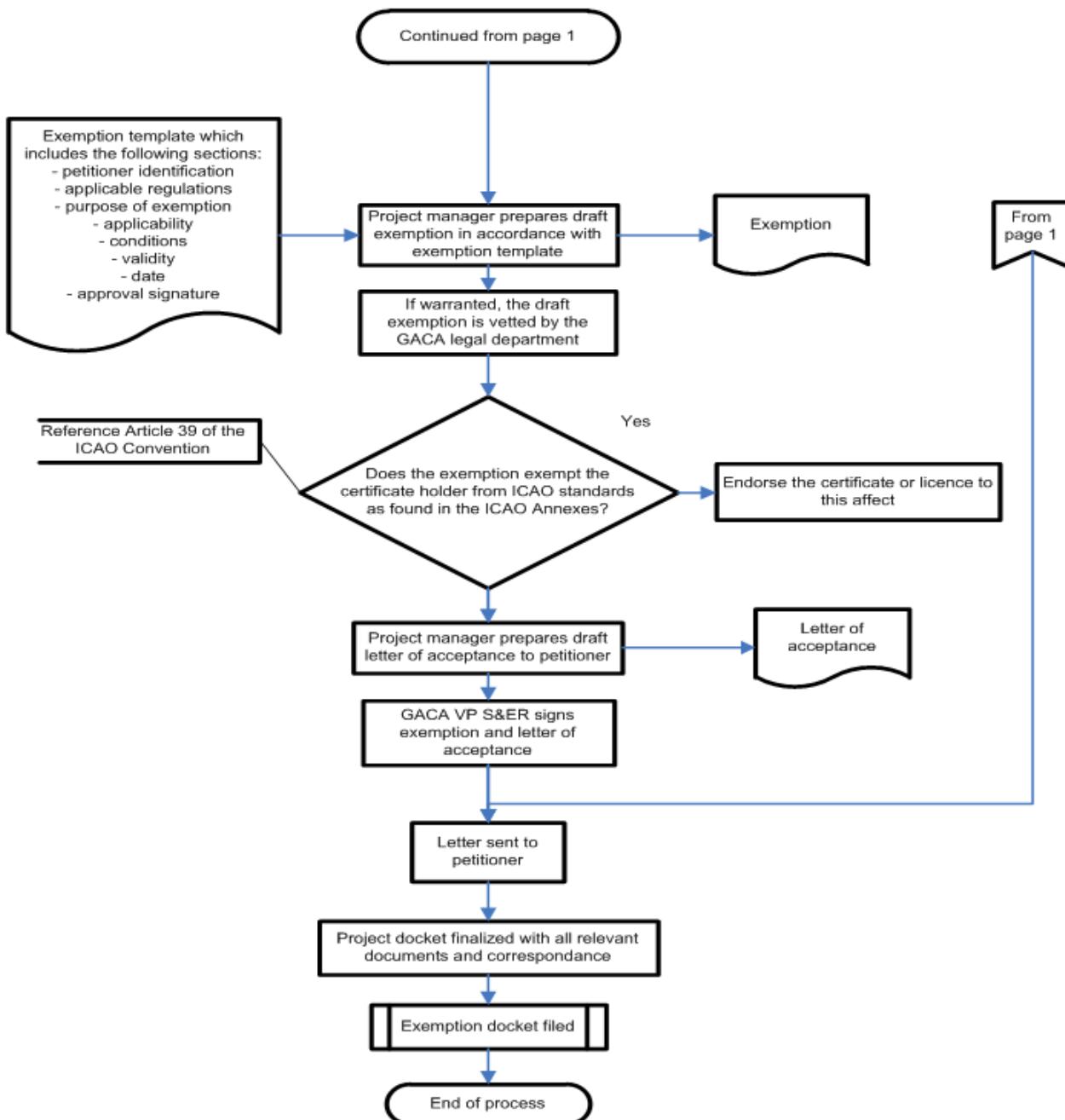
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**Figure 4.2.1.1. Exemption Work Flow Map for Inspectors**



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**Figure 4.2.1.1. Exemption Work Flow Map for Inspectors, Continued**



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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 2. EXEMPTIONS, WAIVERS AND AUTHORIZATIONS**

##### **Section 2. Waivers and Authorizations**

###### **4.2.2.1. GACA ACTIVITY REPORT (GAR).**

A. (TBD)

###### **4.2.2.3. GENERAL.**

**A. Waivers.** The President may issue a Certificate of Waiver authorizing the operation of aircraft in deviation from any rule listed in General Authority of Civil Aviation Regulation (GACAR) § 91.611 - List of Rules Subject to Waivers, if he finds that the proposed operation can be safely conducted under the terms of that Certificate of Waiver.

**NOTE:** No requirements other than those listed in GACAR § 91.611 may be waived with a *Certificate of Waiver*.

**B. Authorizations.** When a regulatory section stipulates the language “unless otherwise authorized (or unless otherwise approved) by the President”, an operator may petition the General Authority of Civil Aviation (GACA) for an authorization to deviate from that particular rule. The authorization, if approved, will then be issued via one of the following:

1) *Operators with OpSpecs.* GACAR Part 121, 125, 133, 135, 141, 142 and 145 operators/agencies receive the authorization by way of OpSpecs.

2) *GACAR Part 129 Operators.* GACAR Part 129 foreign air carriers receive the authorization by way of authorizing documents issued under Part 129.

3) *Non-Certificated Operators/Service Providers.* All non-certificated operators and/or service providers will receive the authorization by way of a Certificate of Authorization.

###### **4.2.2.5. PROCEDURES TO OBTAIN A WAIVER OR AUTHORIZATION.** To apply for a specific waiver or authorization, an operator must submit a request to the GACA. The application must be made by a letter that identifies the specific regulatory section from which a special authorization is

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requested. The letter and attachments, if appropriate, must contain the specific reasons the special authorization is requested, information to show that an equivalent level of safety will be maintained, and any other information the President may require. The types of information that must be submitted with the request for a waiver or authorization are described in other sections of this handbook that relate to the specific subject matter. Approval, denial, and reconsideration procedures for processing waiver or authorization requests must be the same as the procedures for processing, issuing, or amending OpSpecs.

**4.2.2.7. INSPECTOR RESPONSIBILITIES.** The application must be processed in a timely manner. The assigned aviation safety inspector (Inspector) must review the application, obtain appropriate additional information from the applicant, if necessary, and determine whether the applicant has provided adequate justification for a waiver. The Inspector must also determine whether the applicant will provide an equivalent level of public safety during the conduct of any operation under a certificate of waiver or authorization. If the application is denied, the reasons for denial must be specified in a letter to the applicant. If the waiver or authorization is to be granted, the Inspector must prepare the Certificate of Waiver or authorization (OpSpec, Authorizing Document, Certificate of Authorization), as applicable. The completed waiver or authorization dated and signed by the responsible GACA representative, will be delivered to the applicant. A copy of the application for the waiver or authorization and a copy of the completed waiver or authorization must be retained in the GACA office files.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 2. EXEMPTIONS, WAIVERS AND AUTHORIZATIONS**

##### **Section 3. Cockpit Authorizations**

###### **4.2.3.1. ADMISSION TO THE FLIGHTDECK: PHYSICAL, COGNITIVE, AND LANGUAGE CAPABILITIES.**

**A. General Guidance.** Aviation safety inspectors (Inspectors) must use the policies and guidance listed below to determine the physical, cognitive, and language capabilities of any person requesting authorization to occupy an observer's seat on the flightdeck before issuing a formal Admission to Flightdeck Authorization. In addition, Inspectors should encourage operators being regulated under the General Authority of Civil Aviation Regulations (GACARs) to incorporate these policies and guidance information into their manuals for use by their personnel. Any General Authority of Civil Aviation (GACA) personnel occupying any observer's seat on the flight deck will comply with the minimum physical, cognitive, and language capabilities in Paragraph B, below.

**B. Minimum Physical, Cognitive, and Language Capabilities.** Any person who occupies any observer's seat on the flightdeck must:

- 1) Possess sufficient physical mobility, strength, and dexterity in both arms, hands, legs, and feet to reach upward, sideways, and downward to the location of any emergency exits, exit slide operating mechanisms, emergency exit devices (descent reel, tape, or rope), and observer's seat operating mechanisms.
- 2) Be able to, without assistance, physically grasp, push, pull, turn, or otherwise expeditiously manipulate any emergency exit, exit slide operating mechanisms, emergency exit devices (descent reel, tape, or rope), and observer's seat operating mechanisms.
- 3) Be able to, without assistance, physically push, shove, pull, or otherwise expeditiously open or provide access to any emergency exit.
- 4) Be able to physically reach all emergency exits expeditiously without the assistance of any person and appliance, such as crutches, a wheelchair, or a cane.

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5) Be able to physically don and use the observer's seat oxygen mask, life preserver, smoke goggles, and appropriate Protective Breathing Equipment (PBE) without assistance from any crew member.

**NOTE:** The intended user of the equipment listed in paragraph 4.2.3.1.B5 above must personally assure that a good fit and seal can be achieved using the equipment that is provided by the aircraft operator. An individual's facial hair (beard, mustache, etc.) may affect the efficiency and performance of a mask. The lack of a seal between the mask and skin will result in a reduced amount of oxygen in the mask and may allow the entry of smoke or toxic fumes into the mask that could result in an individual's reduced capability, awareness, and performance, potentially causing a distraction to the flight crew during an emergency. Individuals with facial hair that will affect the efficiency and performance of a mask should not occupy a seat on the flight deck. If an air operator's policy results in a bearded Inspector being denied access to the flight deck jump seat, the Inspector will comply with that policy.

6) Be able to physically operate the seat belt and shoulder harness mechanisms and assemblies located at the observer's seat without assistance from any crew member.

7) Possess sufficient visual capacity to perform the specified physical capabilities with regard to emergency exits, operating mechanisms, and emergency equipment without the assistance of visual aids beyond contact lenses or eyeglasses.

8) Possess sufficient aural capacity to hear and understand instructions by crew members without assistance beyond a hearing aid.

9) Possess the ability to impart adequately information orally to crew members.

10) Possess the ability to read and understand instructions related to emergency evacuation procedures and equipment provided by the appropriate certificate holder in text or graphic form.

11) Possess the ability to hear and understand oral crew member commands or instructions.

### **4.2.3.3. PROCEDURES FOR OPENING, CLOSING, AND LOCKING OF FLIGHTDECK DOORS.**

#### **A. Background.**

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1) GACAR § 25.772 requires an emergency means to enable a cabin crew member to enter the flightdeck should the flight crew become incapacitated. This applies to airplanes that are certificated under GACAR Part 25 after 2002 and is not retroactive to older airplanes. The operational requirements found in GACAR Part 121, Appendix G, I(a)(40) also require each operator to establish methods that enable a cabin crew member to enter the flightdeck in the event that a flight crew member becomes incapacitated. These methods are intended for use under emergency conditions and not for routine access to the flightdeck. As such, aircraft electronic keypads or electronic pushbuttons installed in the cabin must be used only in emergency situations.

**NOTE:** The only time the crew may use the emergency flightdeck access procedure during normal operations is when the aircraft is on the ground, the flightdeck door is closed and locked, and the flightdeck is unoccupied.)

2) Unless an operator has a GACA approved procedures under GACAR § 121.1165, the flightdeck door must remain closed during flight time. In order to operate the flightdeck door during flight time and permit flight deck access by persons authorized in accordance with GACAR § 121.1145, Part 121 operators must develop and use GACA approved procedures regarding the opening, closing, and locking of the flight deck door. These approved procedures should be included in the operators' operations and cabin crew member manuals. Additionally, GACAR Part 121, Appendix G, I(a)(40) requires any associated signal or identity confirmation system to be easily detectible and operable by each flight crew member from his duty station. To meet security needs of accomplishing an audio and visual identification, one person on the flightdeck is required to visually identify the person seeking access through the viewing port or viewing device.

### **B. Operator's Procedures .** Operators' procedures must include at least the following:

- 1) Normal procedures for opening flight crew compartment doors to include:
  - a) Who is authorized to have access to the flightdeck.
  - b) How a crew member verifies the identity of a person requesting access to the flightdeck. This process must include a positive means for flight crew members to identify persons requesting entry to the flightdeck and to detect suspicious behavior or a potential threat before unlocking the flightdeck door. To meet security needs of accomplishing an audio and visual identification, one person on the flightdeck is

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required to identify visually the person seeking access through the viewing port or viewing device.

- c) How flightdeck door keypad access codes are disseminated (i.e., flightdeck door keypad access codes may be disseminated through the operator's normal manual issuance and revision process).
- d) Cabin crew member procedures to verify there are no passengers in any forward lavatory, and no passengers are standing in the area surrounding the flightdeck door.
- e) Cabin crew member procedures for blocking the passenger aisle when the flightdeck door is opened.
- f) Procedures for two person flight crews, when one flight crew member leaves the flightdeck (i.e., a cabin crew member must lock the door and remain on the flightdeck until the flight crew member returns to his station).

### 2) Emergency electronic keypad or emergency pushbutton procedures to include:

- a) Events requiring the use of emergency procedures (i.e., pilot alerts).
- b) Determining when the flight crew is, or is suspected of being, incapacitated, or when there is no response from the flightdeck.
- c) Keeping the flightdeck door locked until an audio and visual verification of the person requesting entry is made.
- d) How to determine whether a person requesting access is under duress.
- e) How to determine when the flightdeck door locking system may be taken out of the deny access position.
- f) Flight crew procedures to follow when an electronic keypad or pushbutton is being used to gain unauthorized access to the flightdeck.
- g) When the flight crew must take immediate action to deny access to the flightdeck.

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3) Crew member training programs should include these procedures, associated crew member duties and responsibilities, crew coordination, and emergency situation training modules in appropriate curriculum segments.

**C. GACA Approval Process.** To comply with GACAR § 121.1165, principal inspectors (PIs) are to review and approve their assigned operator's procedures in accordance with the current approval process found in this handbook and the guidance provided in this paragraph.

### 4.2.3.5. IOSA AUDITS: ACCESS TO FLIGHTDECK.

#### A. Background.

- 1) Code sharing is a marketing arrangement through which an airline places its designator code on flight(s) operated by another airline, thus permitting the selling and issuing of tickets for those flight(s). Air operators throughout the world continue to form code-share alliances to strengthen or expand their market presence or competitive ability.
- 2) Air operators seeking or maintaining a code-share agreement with foreign operators are required to submit to the President a code-share monitoring program for each code-share agreement.

**B. Additional Guidelines.** The GACA works with the International Civil Aviation Organization (ICAO) and other civil aviation authorities to improve safety oversight through the implementation of international standards. One of the key components in this effort is the:

- 1) *IATA Operational Safety Audit (IOSA).* IOSA is an internationally recognized audit system that helps operators maintain a high level of safety and reliability. IOSA saves the operator resources by creating cost efficient, harmonized, internal audit standards. IOSA focuses on the management and control systems of an operator. Auditors determine conformity with IOSA standards through the collection and analysis of evidence that indicates whether the operator has properly documented and implemented its processes and procedures.
- 2) The GACA has determined that IOSA may be used as one of the methods to meet the GACA's code share safety monitoring requirements for foreign air carriers. Since the objectives of IOSA are consistent with those of the GACA, in terms of operations and safety, the GACA encourages operators to participate, as may be appropriate.

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- 3) One very important activity associated with an IOSA audit is observing line operations from the flightdeck. This particular activity significantly enhances the effectiveness of the audit by verifying firsthand that the crew properly implements the operator's procedures during line operations.
- 4) The IOSA program provides specific, high level qualification standards for the auditors who will assess line operations. These auditors are familiar with flightdeck operations, understand applicable regulatory requirements, air carrier procedures and protocols, and have extensive experience either as a pilot in air carrier flight operations or as a flight operations air carrier inspector for a regulatory authority. All IOSA auditors must meet rigid qualification requirements in accordance with the IOSA Standards Manual (ISM).

**C. Guidance.** Operators seeking initial or recurrent IOSA registration in accordance with their GACA accepted code share safety monitoring program of foreign air carriers must contact their assigned Inspector regarding jump seat access for an IOSA auditor. Such requests for access to the flightdeck are in accordance with GACAR § 121.1145. Operators must forward all requests for IOSA auditors to observe line operations on foreign air carrier code share partners to their assigned Inspector. The GACA must receive the requests at least 45 days in advance of the planned observation. Operators should include the date(s) that jump seat access is requested for the line observation(s). Upon receiving the request, the GACA will determine the following:

- The request is justified under the IOSA program
- The audit organization is formally accredited by IOSA
- The auditor is qualified to conduct line assessments during audits under the IOSA program
- The GACA approves the auditor to conduct line observations on foreign air carriers

**D. Audit Program.** The GACA recognizes IOSA as the acceptable audit program. One of the following audit approaches must be complied with:

- 1) The foreign air operator must be IOSA registered (reference IOSA Program Manual).
- 2) In the case where a code-share foreign operator is not IOSA registered, the GACAR Part 121 operator shall ensure that a code-share audit of that foreign operator is performed, at least every 24 months, using IOSA standards and recommended practices. The GACAR Part

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121 operator shall ensure that such audit is performed by an IOSA Accredited Audit Organization IAW IOSA Program Manual and that a standard IOSA report is produced.

**E. Approval/Disapproval.** The GACA will review the request and verify the auditor's qualifications and will approve or disapprove the request in accordance with current GACA policy.

**F. Jump Seat Access.** If approved, the Inspector must forward the request for jump seat access and their recommendation for approval to the appropriate code share partner foreign air carrier.

**G. Inspector Priority.** In the case where an IOSA auditor is performing an audit on a GACAR Part 121 operator, and an Inspector has a need to be on that particular flight, it should be noted that the Inspector has statutory requirements to conduct inspections from the flightdeck jump seat, and as such, has priority should the Inspector and IOSA auditor plan to occupy the same flightdeck jump seat.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125**

##### **Section 1. Evaluate a Continuous Airworthiness Maintenance Program (CAMP)**

###### **4.3.1.1. GACA ACTIVITY REPORT (GAR).**

A. 3330 (AW)

**4.3.1.3. OBJECTIVE.** This section provides General Authority of Civil Aviation (GACA) policy and guidance on evaluating a Continuous Airworthiness Maintenance Program (CAMP).

**NOTE:** This section includes information on all 10 elements of a CAMP. Because of the large amount of detailed information needed for some CAMP elements, there are additional sections of this chapter that address individual elements.

###### **4.3.1.5. GENERAL INFORMATION.**

**A. Legal Basis for CAMP.** Each air operator under General Authority of Civil Aviation Regulation (GACAR) Part 121 must establish and maintain a CAMP that complies with GACAR §§ 121.659 through 121.703. Additionally, GACAR Part 135 permits an air operator to voluntarily implement a CAMP that complies with the applicable GACAR Part 121 requirements for a CAMP.

**B. CAMP Program Elements.** An operator's CAMP program includes the following 10 elements:

- Airworthiness responsibility
- Operator maintenance manual
- Operator maintenance organization
- Accomplishment and approval of maintenance and alterations

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- Maintenance schedule
- Required Inspection Items (RII)
- Maintenance recordkeeping system
- Contract maintenance
- Personnel training
- Continuing Analysis and Surveillance System (CASS)

### **4.3.1.7. ADMINISTRATIVE.**

#### **A. References.**

- GACAR Parts 43, 91, 119, 121 and 135
- Federal Aviation Administration (FAA) Advisory Circular (AC) 120-16 (as amended), Operator Maintenance Programs
- FAA AC 120-79 (as amended), Developing and Implementing a Continuing Analysis and Surveillance System
- Air Transport Association (ATA) MSG-3, Operator/Manufacturer Scheduled Maintenance Development

### **4.3.1.9. AIRWORTHINESS RESPONSIBILITY.**

#### **A. Responsibility for Aircraft Maintenance.**

1) Per GACAR § 121.659, the operator is primarily responsible for the airworthiness of its aircraft, and the performance of all of the maintenance on its aircraft. The GACAR Part 121 Air Operator Certificate (AOC) makes the operator a maintenance entity. Under the AOC, the operator accomplishes maintenance, preventive maintenance, or alterations, or it can use other persons who are not direct employees to accomplish that work. Consistent with GACAR § 121.1(a)(2), Part 121 regulations govern each person that the operator employs or uses for any maintenance, preventive maintenance, or alteration of the operator's aircraft.

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Each person who is used by the operator must be under the operator's direction and control and must follow the operator's maintenance program. The operator should note the definition of "person" in GACAR § 1.1.

2) The operator retains direct and primary responsibility for performing and approving all maintenance, preventive maintenance, and alterations on its aircraft, whether the operator or a maintenance provider, such as a repair station accomplishes that work. Additionally, the operator retains primary responsibility for the approval of the maintenance done by that maintenance provider.

### **4.3.1.11. OPERATOR MAINTENANCE MANUAL.**

#### **A. Operator Maintenance Manual Requirement.**

1) GACAR §§ 121.139 and 121.683 require the operator to have a maintenance manual. Some operators call their manuals "specifications". Appendix G to GACAR Part 121 provides a full listing of the required contents for the maintenance manual.

2) The operator's maintenance manual must be easy to revise and have procedures for keeping all parts of the manual up to date.

3) The operator must make copies of its manual or appropriate portions of it, including changes or additions, available to those persons who are required to comply with it. The operator must also provide a copy to the Principal Inspectors (PI). Each person to whom the operator furnishes a manual, or appropriate parts, must keep it up to date.

#### **B. Role of the Operator's Maintenance Manual .**

1) The operator's maintenance manual is the key to the standardized, consistent accomplishment and administration of the operator maintenance program.

2) The operator maintenance manual:

- Identifies, describes, and defines the operator maintenance program
- Provides instructions and procedures to administer, use, manage, and amend the maintenance program

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3) The operator maintenance manual is a company publication, and the operator has sole responsibility for its organization and content. However, others may compile and publish it for the operator. The operator maintenance manual may be electronic.

### C. Major Sections of the Typical Operator Maintenance Manual.

1) *Organization of the Operator's Maintenance Manual*. The operator's maintenance manual should have a practical organization. Typically, it will have at least three sections:

a) Administrative policies and procedures. The operator's maintenance manual is a management and administrative tool for organizing, directing, amending, and controlling the maintenance program. Organizational charts delineating the functions, relationships, and lines of authority between organizational elements and personnel usually are identified here. This section is where the operator lists descriptions, duties, responsibilities, and specific authority and responsibility attributes for each position within its maintenance organization. The authority and responsibility attributes should show who has overall authority and/or responsibility, and who has direct authority and/or responsibility.

b) Instructions for the administration, management, and accomplishment of the maintenance program.

1. This section contains detailed instructions for the operator's management of the various functions and interrelationships of each maintenance program element, such as maintenance time limitations, recordkeeping, maintenance program management and oversight, contract maintenance management and oversight, and personnel training. This section usually includes a description of scheduled maintenance tasks, procedural information, and detailed instructions (or specific operator maintenance manual references) for accomplishing maintenance tasks. Additionally, the operator should describe criteria for initiating functional evaluation flights in this section of the maintenance manual, along with procedural requirements for them. In this section of its manual, the operator should also include criteria and procedural information for unscheduled inspections, such as those associated with lightning strikes, tail strikes, engine temperature exceedance, dangerous goods spills, landings at a mass greater than the certificates limit and any very high-load event.

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2. The operator should have a comprehensive process in the unscheduled maintenance portion of its manual that addresses those rare, extremely high-load events that occur to aircraft. Specifically, the operator should have inspection processes that are used following certain high-load events. These particular high-load events are those for which the subsequent inspection process might benefit from the use of flight data. Listed below are the most significant events:

- Flight events:
  - A severe turbulence encounter
  - Extreme maneuvers
  - Exceedance of speed limitations
  - Heavy stall buffet
- Ground events:
  - Hard landings
  - landing at a mass greater than the certificates limit
  - Drift landings resulting in excessive side/drag load

3. These high-load events typically have detailed inspection instructions specified in Original Equipment Manufacturer (OEM) maintenance manuals. The objective of these instructions is to detect aircraft damage following an in-service flight or ground event. The manufacturer typically refers to these instructions as unscheduled maintenance or special inspections. While there are many conditions that can result in high loads on the airframe and subsequent structural damage, the GACA considers the use of flight data in the operator's inspection process particularly beneficial for the events identified above.

4. The operator's processes for evaluating these events should address:

- Appropriate indication that an event has occurred

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- Evaluation of the severity of the event
  - Coordination with the manufacturer, as appropriate
5. The operator's special inspection procedures for high-load events should be robust enough to:
- Identify that a very high-load event occurred
  - Assure that indications of structural damage would be found in an initial inspection,
  - Involve the OEM if necessary
  - Provide a process for additional inspections that would identify all of the structural damage
  - Provide a process for approval for return to service
- c) Technical data that describe maintenance standards, methods, techniques, and procedures. This section of the operator's manual concerns detailed procedures for accomplishing specific tasks. The operator should describe methods, techniques, technical standards, measurements, calibration standards, operational tests, structural repairs, etc. in this section. The operator should also include procedures for aircraft mass and balance control, jacking, lifting, shoring, storage, cold, hot and dusty weather operations, towing, aircraft taxi, and aircraft cleaning. The operator can derive its maintenance manual contents from the manufacturer's publications. However, based on the operator's particular service experience, organization, and operating context, the GACA expects it to continuously modify and customize its maintenance manual as necessary for the continuing success of its maintenance program. This is one of the desired outcomes of a well-functioning CASS, which Section 5 of this chapter explains in more detail.

### 2) *Work Cards.*

- a) Work cards, while not a regulatory requirement, have evolved as a best practice. The GACA considers work cards part of the operator manual and the operator's
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maintenance program. They are the “*what to do*” and “*how to do it*” part of the operator’s airworthiness responsibility. The operator uses work cards as a simple means of complying with regulations for performing maintenance, as well as maintenance recordkeeping. Work cards provide detailed, concise procedural instructions that organize and control the operator’s maintenance activities while providing a means to ensure that its maintenance activities comply with the operator’s maintenance manual. It is an easy way to make sure maintenance, as well as other personnel, are following the operator’s procedures.

- b) The operator is responsible for the development, control, and proper use of its work cards. The operator’s work cards should be in a form that is simple to use and simple to revise. The operator should control each card and have the date of last revision on each page. Each card should include instructions and the information necessary for personnel concerned to perform the assigned work with a high degree of safety. The operator should use the aircraft manufacturer’s maintenance manual procedures and drawings as the basis for developing its own work cards. The operator should give special attention to work cards involving required inspections and flight control systems to ensure that they are accurate, and contain complete and relevant technical data and drawings. The operator should include discrete (separate or distinct) tasks with individual inspection sign-off requirements for post-rigging verification.
- c) The second primary function of work cards is to document the operator’s maintenance activities, providing a means to comply with the operator’s maintenance recordkeeping requirements. Work cards may also document the results of inspections, checks, and tests for data collection and analysis. The operator’s work-in-progress audits of work card activity that it conducts under its CASS ensure that each person who accomplishes work on the operator’s aircraft is following the operator’s manual.

### **4.3.1.13. OPERATOR MAINTENANCE ORGANIZATION.**

**A. Maintenance Organization—General** Operators are required to have a maintenance organization that is able to perform, supervise, manage, and amend its program; manage and guide its maintenance personnel; and provide the direction necessary to achieve its maintenance program objectives. Regulations require the operator to include a chart or a description of its maintenance organization in its manual. These organizational regulations apply to the operator’s organization, as well as any other organization that provides maintenance services for it. A chart

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is a good way to show the operator's assignment of overall and direct authorities and responsibilities.

**B. Required Maintenance Organization Management Positions.** GACAR § 121.45 includes specific requirements for maintenance management positions for operations under Part 121. These are a Director of Maintenance (DOM) and a Chief Inspector, or equivalent positions. These individuals must be qualified and serve full-time in their positions. These are management positions required by the regulations; however, they are not all of the management positions that the operator will need to administer and manage its maintenance organization. The President may approve positions or numbers of positions other than those listed in paragraphs (a) and (b) of GACAR § 121.45 for a particular operation if the operator shows it can perform the operation safely under the direction of fewer or different categories of management personnel. Regulations require the operator to list, in its manual, the names and addresses—and to state the duties, responsibilities, and authority—of each of its required management personnel. It is recommended that the operator state in its manual who has overall authority and/or responsibility, and who has direct authority and/or responsibility for a given process. Also, the operator is required to notify the GACA when it makes changes in its required management personnel or when it has a vacancy.

**NOTE:** Per GACAR § 121.45(b) operators conducting special unscheduled operations are not required to employ a Chief Inspector.

**NOTE:** Authority means the power to design or change fundamental policy or procedures without having to seek higher-level approval. Authority is permission; it is a right coupled with an autonomous power to accomplish certain acts or to order others to act. Often one person grants another authority to act, such as an employer to an employee, a corporation to its officers, or a governmental empowerment to perform certain functions.

**NOTE:** Responsibility means the obligation to ensure a task or function is successfully carried out. Responsibility includes accountability for the action to carry out a task or function.

### C. Required Operator Maintenance Organization Structure.

1) The regulations defining an operator maintenance organization are necessarily broad given the different types and sizes of operators. A single means of compliance or a single organizational chart that would apply to all operator organizations is not possible.

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2) The operator should designate a single person or position as the accountable manager with the authority and the overall responsibility for managing and implementing its entire maintenance program, including all inspection functions. The inspection functions and the required inspection functions are part of the operator's maintenance program. The GACA expects the operator to designate its DOM as the accountable manager for its maintenance program. The GACA bases its expectation on the DOM position being a management position required by regulations, with specific regulatory responsibilities and qualifications. Additionally, the GACA authorizes the DOM position through Operations Specifications (OpSpecs), which the GACA can amend if it determines that safety and the public interest require the amendment.

3) The GACA expects the operator's maintenance organization to have three general organizational functions to ensure that it is conducting all operations to the highest possible degree of safety. If the operator is a larger organization, it may have different departments for each level, while in the smallest organizations one or two individuals may carry out these functions. Generally, these three organizational functional levels include:

- Mechanics and/or Inspectors performing the work at the first level (operations)
- Middle managers and supervisors at the second level (tactics)
- The maintenance program accountable manager at the third level (strategy)

4) The GACA expects to see clear authority and responsibility in an operator's maintenance organization, including delegated responsibility, for the overall maintenance program and all of its elements and functions. The operator should include a description of each individual's duties and responsibilities in its manual so that there is not a fragmented organizational system with a high risk for confusion over who is responsible for a given element, process, or task.

### D. Organizational Separation of the Inspection and Maintenance Departments.

1) There is a clear regulatory requirement for a maintenance organization in GACAR § 121.675. Because inspection is an integral part of the air carrier's maintenance organization, there is no regulatory requirement for an inspection organization. There is no regulatory requirement to separate the operator's inspection department, if it has one, from the rest of its

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maintenance organization, because inspection is integral to maintenance. The GACA has defined “maintenance” in GACAR § 1.1 as “the inspection, overhaul, repair, preservation, and the replacement of parts, but excludes preventive maintenance.” If the operator chooses to have an inspection department, it must organize it as an integral part of its maintenance organization.

**NOTE:** There is a distinction between “inspection” as used in GACAR § 1.1, under the definition of maintenance, and the reference to “required inspection” used in GACAR § 121.675(b). As indicated in § 1.1, the definitions apply unless the context stated elsewhere in the regulations requires otherwise. “Required inspections,” referred to in GACAR § 121.675(b), have significant regulatory meaning within the context of Part 121. Therefore, the operator must comply with each organizational requirement specified in GACAR § 121.675(a) and (b) for the performance of maintenance and the performance of required inspections. Additionally, the operator must organize the performance of the required inspection to separate the required inspection function from other maintenance (another distinction). The person performing the required inspection must be under the supervision and control of the required inspection unit, not the maintenance unit.

2) GACAR § 121.675 (c) requires operators to organize the performance of all maintenance functions (including inspection, repair, overhaul, and the replacement of parts) to separate the function of required inspections from the function of other maintenance, preventive maintenance, and alteration activities. This organizational separation must be below the level of administrative control, where the operator exercises overall responsibility for the required inspection functions as well as the other maintenance, preventive maintenance, and alteration functions.

### **4.3.1.15. ACCOMPLISHMENT AND APPROVAL OF MAINTENANCE AND ALTERATIONS.**

#### **A. Accomplishment of Maintenance.**

1) GACAR §§ 43.5(f), 43.9(e) and 121.663 authorize an operator, as a maintenance entity, to perform maintenance on its own operator aircraft and to approve them for return to service without obtaining any other maintenance certification. In addition, GACAR § 121.663 provide clear authority for the operator, under its operator certificate, to perform maintenance on behalf of other operators who conduct operations under the same part as its own.

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2) Each individual who makes an airworthiness determination on the operator's behalf must hold an appropriate airman's certificate. GACAR § 121.655 requires that any individual who the operator puts directly in charge of performing maintenance hold an appropriate airman certificate, such as a mechanic certificate with ratings appropriate to the work being performed. GACAR § 121.687 requires that any individual that the operator authorizes to perform a Required Inspection Item (RII) for it hold an appropriate airman certificate. GACAR § 121.1545 requires that anyone who the operator authorizes to issue an approval for return to service hold an appropriate airman's certificate. The operator's DOM and Chief Inspector must hold an airman's certificate issued under GACAR Part 66 with airframe and powerplant ratings. These certificate requirements are management qualification requirements. The DOM and Chief Inspector do not receive authority from, and exercise the privileges of, their airman certificate. The operator's certificate is the authority for the performance and approval of all maintenance, preventive maintenance and alterations not any individual or organization under their certificate. One exception to the individual airman certificate requirement occurs if the operator arranges for a certificated repair station located outside of the Kingdom of Saudi Arabia (KSA) to perform maintenance. At these repair stations, individuals directly in charge of performing maintenance or required inspections are not required to hold GACAR Part 66 airman certificates.

**B. Major Repairs and Alterations.** GACAR Part 43, Appendix A contains a list of repairs and alterations that are considered major but this appendix does not address every unique situation. As a consequence, operator's should have detailed major/minor classification procedures in its manual to evaluate each repair or alteration on a case-by-case basis, using such factors as the certification basis of the aircraft; classification of the structure as primary, secondary, or a primary structural element; or classification as a fail-safe, safe-life, or damage-tolerant structure.

**C. Airworthiness Release Form or Aircraft Log Entry and Approval for Return to Service.** After performing any maintenance on its aircraft, the operator must issue an airworthiness release or aircraft log book entry as prescribed under GACAR § 121.1545 before the operator may operate the aircraft.

**D. Scope of Maintenance.** The operator must provide instructions in its maintenance program and maintenance manual for maintenance and alterations encompassing the four areas of *what to do, when to do it, how to do it, and was it done properly* in at least three major areas:

- 1) *Scheduled Maintenance.* Scheduled maintenance consists of all the individual

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maintenance tasks performed according to the maintenance time limitations (maintenance schedule). The operator's scheduled maintenance activities should include procedural instructions for the maintenance tasks and requirements to record the results of the inspections, checks, tests, and other maintenance.

### *2) Unscheduled Maintenance.*

- a) Unscheduled maintenance includes procedures, instructions, and standards for maintenance that occur on an unscheduled or unforeseen basis. A need for unscheduled maintenance may result from scheduled maintenance tasks; pilot reports; or unforeseen events, such as high-load events, hard landings, landings at a mass greater than the certificates limit, tail strikes, ground damage, lightning strikes, sand storms, or an engine over-temperature. The operator should include in its manual instructions and standards for the accomplishment and recording of unscheduled maintenance, and detailed procedures for recording all types of unscheduled maintenance.
- b) The operator should include a comprehensive process in the unscheduled maintenance portion of its manual that addresses those rare, very high-load events that occur to aircraft. These very high-load events may result in structural damage, but unless the operator has comprehensive procedures to identify and evaluate this damage, the operator might not identify this damage before it approves its aircraft for return to service. The operator's manual should include very high-load event special inspection procedures that address at least these four objectives:
  - Identify that a very high-load event has/has not occurred
  - Assure that indications of structural damage are found in an initial inspection
  - Involve the OEM if necessary
  - Provide a process for additional inspections that would identify all of the structural damage

### *3) Specific Maintenance Requirements for Major Aircraft Components.*

- a) The operator's engine maintenance program should cover the maintenance of installed engines and off-wing engines for each engine model it operates. If the

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operator's aircraft have auxiliary power units (APU), the operator may want to include APU maintenance as part of its engine maintenance program. Usually, the installed engine or APU requirements will be in the maintenance time limitations. In addition to procedural information, the off-wing program described in the operator's maintenance manual should provide shop scheduling information or intervals for cleaning, adjusting, inspecting, testing, and lubricating each part of the engine or APU requiring that maintenance. The operator should include in its maintenance manual the degree of inspection, the applicable wear tolerances, and the work required when the engine or APU is in the shop.

b) If applicable, the operator's propeller maintenance program should cover the maintenance of installed propellers and off-wing propellers for each model it operates. Usually, the installed propeller system scheduled maintenance requirements will be contained in the maintenance time limitations. In addition to procedural information, the off-wing program described in the operator's manual should provide shop scheduling information or intervals for cleaning, inspecting, adjusting, testing, and lubricating each part of the propeller system requiring that maintenance. The operator should include in its maintenance manual the degree of inspection, the applicable wear tolerances, and the work required at these periods. Some modern propellers are constructed of composite materials and, therefore, may require unique tools, repair procedures, and specialized training for operator maintenance personnel.

**E. Parts and Appliances Maintenance Program.** For the most part, this component of the operator's maintenance program covers shop operations, which may include both scheduled and unscheduled tasks. The operator may conduct these shop operations at some location other than where it performs maintenance on its aircraft. The operator's parts and appliance maintenance program should cover both installed parts and appliances and off-wing maintenance for each part and appliance model that the operator operates. Usually, the installed part and appliance scheduled maintenance requirements will be contained in the maintenance time limitations. In addition to procedural information, the off-wing program described in the operator's maintenance manual should provide shop scheduling information or intervals for cleaning, adjusting, inspecting, testing, and lubricating each component of the part and appliance requiring that maintenance. The operator should include in its maintenance manual the degree of inspection, the applicable wear tolerances, and the work required when the part or appliance is in the shop.

### 4.1.1.17. MAINTENANCE SCHEDULE.

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**A. The Maintenance Schedule.** GACAR § 121.667 requires an operator to have time limitations, also called a maintenance schedule. These same rules allow an operator to make standards for determining time limitations. This language is the basis for GACA approved reliability programs. Maintenance time limitations set out the what, how, and when of the maintenance schedule. Maintenance time limitations include a specific list of each individual maintenance task and its associated time limit. The regulations are broad enough to permit the operator to organize individual tasks into a series of integrated scheduled work packages for the entire aircraft.

**B. The GACA's Role in Relation to the Maintenance Schedule.** The GACA authorizes an operator's maintenance schedule through its OpSpecs, and its CASS monitors that schedule to verify its effectiveness (i.e., producing the desired results). The operator's CASS will be its principal source of information that might indicate a needed change to its maintenance schedule. The GACA expects an operator to correct any deficiencies in its maintenance schedule. Under GACAR § 121.691(b), if an operator does not make needed changes, the GACA can require it to change its maintenance schedule or any other element of its maintenance program found deficient.

### C. Maintenance Schedule Contents.

- 1) An operator's maintenance schedule should contain at least the following information:
  - a) *What (unique identifier).* The operator is going to maintain this item. The operator's identifier should be specific enough to allow the item to be easily and accurately identified by the individual assigned to do the scheduled maintenance task.
  - b) *How (task).* How to maintain the item; i.e., the scheduled maintenance task to be accomplished. A scheduled maintenance task is a maintenance action that the operator performs at regular, scheduled intervals so that it can ensure that the item can continue to perform its intended function within its operating context; so that the operator can discover a hidden failure; or to ensure that a hidden function is available. The operator should not use terms such as hard-time (HT), On-Condition (OC), or condition monitored in its maintenance schedule. These terms represent obsolete 1960s methodology; they are vague, and do not describe the maintenance task the operator is performing. If the operator's maintenance schedule contains these terms, there is a risk that the scheduled maintenance it wants and needs may not be the maintenance that it is getting.

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**NOTE:** The GACA will not cancel any existing authorized operator maintenance schedule simply because it was derived from Maintenance Steering Group — 2nd Task Force (MSG)-1 analysis and uses the terms HT, OC, and condition monitored. Principal maintenance inspectors (PMIs) should encourage their assigned operators to utilize the less confusing MSG-3 task type terminology in their maintenance schedule rather than the MSG-2 process-type terminology. See Section 4 of this Chapter for more information on MSG-2 to MSG-3 conversions.

- c) *When (frequency).* The time in service interval between the times when the operator accomplishes scheduled maintenance task. The operator measures its intervals in time-in-service and it may measure them by calendar-time, operational hours, flight cycles, or any other appropriate parameters. In addition, for task management, inventory, and audit purposes, the operator should identify, on the maintenance schedule, the task or work card associated with each scheduled maintenance task. This way, it can ensure that it is accomplishing all of its scheduled maintenance tasks according to its schedule.
- 2) The operator's overall maintenance schedule objective is to correctly do the correct tasks at the correct interval. Keep in mind that more maintenance is not always a good idea, so if the operator decides to decrease intervals or add tasks, it should go through the same justification process as any other change to the maintenance schedule.

### D. Standards for Determining Maintenance Time Limitations.

- 1) GACAR § 121.667 permits operators to have standards for determining its maintenance time limitations. Most aircraft manufacturers have used the ATA's MSG-3 decision logic to help them develop scheduled maintenance requirements for their new products. Besides providing organization and flow to the deliberative process, the primary attribute of the MSG-3 process is that the user can develop initial scheduled maintenance requirements without the operational data required to determine the need for scheduled maintenance tasks. Using the techniques of the MSG-3 decision logic, it is simple for the operator to decide the required tasks in its initial scheduled maintenance program. However, the MSG-3 decision logic does not contain task interval selection decision logic to help the user determine where to set the task intervals or how to adjust them after the operator initiates service. Using the MSG-3 process, initial task intervals are set based on knowledge of the design and the best judgment of the working group members. Under MSG-3, initial intervals

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are, essentially, a best guess. As a result, validation of initial interval selections must occur when the aircraft begins service and starts generating the operational data that was not available when the initial intervals were set.

2) An inherent function of an operator's CASS is to determine the effectiveness of its scheduled maintenance effort through operational data collection and analysis activity. The operator uses this important function to determine the level of scheduled maintenance effectiveness and to make the changes necessary to achieve the standard of effectiveness that it has set. Effective means that it is producing the desired results. Thus, from an operational standpoint, an indicator of the effectiveness of an operator's scheduled maintenance effort is the availability of the operator's aircraft for flight operations. If the operator's aircraft are unavailable for flight operations due to maintenance reasons, then its scheduled maintenance program may not be as effective as it should be. There may be other elements of an operator's maintenance program, besides the scheduled maintenance element, that may be deficient as well. However, the operator's CASS procedures will identify the root cause and help the operator identify and make the adjustments/changes necessary to achieve the level of flight operations availability (the result) that the operator has set.

**NOTE:** Evaluating a Continuing Analysis and Surveillance (CASS) Program/Revision is discussed in detail in Section 5 of this chapter.

### **4.3.1.19. Required Inspection Item (RII).**

#### **A. RII Function.**

1) GACAR Part 121, Appendix G requires operators to designate certain maintenance tasks as a Required Inspection Item (RII). The RII must cover at least those maintenance tasks that, if not properly performed or if done with improper parts or materials, could result in a failure, malfunction, or defect that would endanger the continued safe flight and landing of the aircraft. In cases where other persons perform maintenance tasks for the operator, the operator may authorize them to accomplish its RII requirement. However, the operator must document the arrangement and control it through its maintenance manual. Consistent with the regulations, the operator remains primarily responsible for the performance of each RII accomplished by the other person.

2) The RII relates directly to flight safety. The operator should consider all of its RII with the same safety of flight consideration and emphasis even if accomplishing an individual RII

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adversely impacts its flight schedule, is related to a scheduled or an unscheduled task, or arises at an awkward time or at an inconvenient location.

3) In order to maintain its significance, the RII list should not be over-inclusive. Instead, the operator should identify specific items of inspection for each aircraft type; it is inappropriate to designate entire systems as an RII. The operator should adhere to a decision process, similar to the following, when creating a list of the RII:

- a) Is the performance of the work on the aircraft? If not, then an RII does not apply, as RII's apply only to installations and repairs on the aircraft.
- b) Is the item potentially deferrable per the minimum equipment list (MEL) or Configuration Deviation List (CDL)? If yes, then an RII does not apply, as those lists contain items of equipment that the Administrator has determined may be inoperative or which the operator may remove while still maintaining aircraft airworthiness.
- c) Is a required test performed on the item that will simulate operational functions and detect failures, malfunctions or defects that would impact the safe flight or landing of the aircraft? If yes, then RII does not apply, as the operator can assess system operational integrity.

4) Some examples of items that may call for required inspections are:

- Proper torque and retainment device installation for engine and landing gear mounting hardware
- Correct travel, cable routing, tensioning, hardware fitting/torque, and retainment device installation for flight control surfaces
- Certain emergency equipment installations for post-installation activation and rigging

5) Each operator must evaluate its work program to identify the RII (critical or essential maintenance). The operator may identify these items with the acronym "RII," an asterisk, or any similar method.

### B. RII Procedures, Standards, and Limits.

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- 1) An operator's manual must include procedures for it to identify the RII and authorize the RII personnel, both within its organization and within other organizations that perform maintenance on its behalf. Each individual that the operator grants an RII authorization to must hold an appropriate airman's certificate. This is an operator qualification requirement; the individual does not exercise the privileges of the certificate when accomplishing the RII. The operator must formally notify each of these individuals of their RII authorization, as well as its scope (GACAR § 121.687(d)).
- 2) The operator should clearly identify its RII requirements on work forms, job cards, engineering orders, etc., or by any other method consistent with its maintenance program. A primary concept of the RII function is that the person performing the item of work may not perform the required inspection on that item of work. Therefore, it is important that the operator identify an RII whenever possible so that everyone knows of the inspection requirement.
- 3) The operator must have those procedures, standards, and limits necessary for the accomplishment of its required inspections. The operator must also have those procedures, standards, and limits necessary for the acceptance or rejection of each of its RII. As the operator will not find the RII or procedures, standards, and limits for the RII in an OEM manual, it will have to develop these and put them in its manual.
- 4) The operator must have procedures in its manual to ensure that only a supervisor of an inspection unit or the person who has overall responsibility for both the RII function and other maintenance and alteration functions may countermand the decision of any RII Inspector regarding an RII (GACAR Part 121 Appendix G.) These requirements apply equally to an organization performing maintenance on its behalf, as well as the operator's own maintenance organization.

### 4.3.1.21. MAINTENANCE RECORDKEEPING SYSTEM.

**NOTE:** Additional information and policy on an operator's maintenance record keeping system may be found in Volume 4, Chapter 11, Section 5 and Volume 4, Chapter 12 of this handbook.

**A. Reasons for Making and Keeping Maintenance Records.** An operator's primary reason to make and retain operator maintenance records is to show that the standard airworthiness certificate on its aircraft is effective and that its aircraft are airworthy. A standard airworthiness

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certificate is effective only as long as the operator performs the maintenance and alterations according to the requirements of the GACARs. If the operator's required aircraft maintenance records are incomplete or inaccurate, it can render its aircraft's standard airworthiness certificate invalid. Maintenance actions, in almost all cases, become intangible or abstract after the fact. Therefore, in order for it to make a maintenance action tangible, the operator must make a record of that maintenance action. Additionally, making a record of certain summary information supports identification of the current inspection and airworthiness status of the operator's aircraft.

**B. Part 43 Requirements.** GACAR Part 43 contains basic record entry requirements for maintenance. GACAR § 43.11(b) shows that the governing requirements for operators are contained in Part 121. The requirements of GACAR § 43.11(b) are consistent with the operator maintenance recordkeeping requirements of GACAR § 121.699(a) & (b) and § 121 Appendix G.

### C. Work Performed by a Repair Station Certificated Under GACAR Part 145.

- 1) GACAR § 145.101 sets forth the requirements for a certificated repair station to retain certain records of maintenance that it performs. It also requires the repair station to make those records available to the GACA. However, GACAR §§ 43.11(a) and 145.101 requirements do not apply when the repair station is accomplishing any work on an operator's aircraft.
- 2) The wording of the GACAR § 145.83, as well as GACAR §§ 119.1(c), 121.1(a)(2), compel a GACAR Part 145 certificated repair station to follow the procedures and requirements of the operator's maintenance program and applicable sections of the operator's maintenance manual when accomplishing any maintenance or alterations on the operator's aircraft. Consequently, a certificated repair station must use the performance standards of GACAR Part 121, including the recordkeeping requirements, instead of following the provisions in GACAR Part 145 and the repair station's repair station manual. The responsibility for retaining records in accordance with the retention requirements of GACAR §§ 121.699(b) rests with the operator, not the repair station. However, if a GACAR Part 145 repair station wants to retain a copy of those records generated by working on an operator's aircraft, the GACARs do not preclude it from doing so. Asking the GACAR Part 145 repair station to keep an operator's records for it is consistent with regulations, although the operator is responsible for retaining them and making them available to the GACA. This is consistent with the requirements of GACAR § 119.107(c).

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### **D. Penalties for Improper Operator Maintenance Recordkeeping.**

- 1) Maintenance records are important for:
  - a) The operator, as operator, to fulfill its responsibility to determine the airworthiness status of its aircraft.
  - b) The GACA. to use them for its continuing review of aircraft maintenance records as a direct means of determining the airworthiness and safety status of operator aircraft.
- 2) Because reviewing maintenance records is often the only direct means of determining the accomplishment of required maintenance, The President treats the act of intentionally failing to make and keep (or the act of intentionally falsifying, mutilating, or altering) operator aircraft records as a serious violation.

### **E. Making and Keeping Required Records.**

- 1) GACA Part 121, Appendix G requires the operator to have and use a recordkeeping system for the preparation, storage, and retention of required aircraft maintenance records. The operator must document its system in its maintenance manual. The primary objectives of these systems are the generation, storage, retention, and retrieval of accurate and complete operator aircraft maintenance records. As stated earlier, these records are primarily made to show that the standard airworthiness certificate of the operator's aircraft is valid, and that its aircraft are airworthy and capable of safe flight.
- 2) GACAR § 119.107(b)(1)(ii)) also require the operator to make and keep a listing that identifies the location of each record, document, and report that the operator is required to make and keep, as well as a listing that identifies each person responsible for each of those records, documents, and reports.

### **F. When to Make Records Available to the GACA.** GACAR § 119.107(c) mandates that the operator must make its operator maintenance records available to the GACA. The GACA can require the operator to make its records available to them at any time.

### **G. Responsibility for Making Records Available to the GACA.** Under GACAR § 119.107(b)(1)(ii), the operator must make a list of persons in its organization that it has designated to be responsible for making each required maintenance record, document, or report available to the

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GACA upon request. The operator must make a list of the location of each record, document, or report. The operator must keep this list current and make it available to the GACA at its principal base of operations.

**H. Required Records.** Regulations require operators to make and keep certain summary status records. GACAR § 121.699 lists recordkeeping requirements and explain them as follows:

1) The total time in service of the airframe, each installed engine, and each installed propeller is a record that contains the time in service accrued since new or rebuilt, expressed in hours, landings or cycles.

**NOTE:** It is important for the operator to know that rebuilt does not have the same meaning as overhauled.

2) The current status of each life-limited part of each airframe, engine, propeller, and appliance means a record that contains at least the following information:

a) The time in service since new, expressed in the appropriate parameter (hours, cycles, calendar-time).

b) The time in service remaining to the specified life limit expressed in the appropriate parameter (hours, cycles, calendar-time).

c) The specified life limit expressed in the appropriate parameter (hours, cycles, calendar-time).

d) A record of any action that alters the part's life limit or changes the parameter of the life limit.

3) The listing of the time since last overhaul means a record that contains at least the following information:

a) An identification of the item that requires overhaul and its associated scheduled overhaul interval.

b) The time in service since the accomplishment of the last overhaul.

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- c) The time in service remaining until the next scheduled overhaul.
- d) The time in service when the next scheduled overhaul is due.

**NOTE:** The listing of time since last overhaul refers to summary current status information. The operator must not confuse it with an overhaul record, which is a description of the work performed and the identification of the person who performed and/or issued the approval for return to service.

4) The current inspection status of the aircraft means a record that contains at least the following information:

- a) A listing identifying each of the scheduled inspection packages and each task, with their associated intervals required by the operator's maintenance program for the aircraft.
- b) The time in service accrued since the last accomplishment of each of the scheduled inspection packages and tasks required by the operator's maintenance program for the aircraft.
- c) The time in service remaining until the next accomplishment of each of the scheduled inspection packages and tasks required by the operator's maintenance program for the aircraft.
- d) The time in service when the next accomplishment of each of the scheduled inspection packages and tasks, required by the operator's maintenance program for the aircraft is due.

5) Current status of applicable Airworthiness Directives (AD). The current status of applicable ADs means a record that contains at least the following information:

- a) Identification of the particular airframe, engine, propeller, appliance, or component to which the AD is applicable.
- b) The AD number (and/or regulatory amendment number).
- c) The date when the operator accomplished the required action and the time in service

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expressed in the appropriate parameter (hours, cycles, calendar-time).

- d) If the requirement is recurring, the date when the next action is due, and the time in service expressed in the appropriate parameter (hours, cycles, calendar-time).
- e) With regard to an AD, the method of compliance means a concise description of the action taken to comply with the requirements of the AD. If the AD or its referenced manufacturer's Service Bulletin (SB) permits the use of more than one method of compliance, the record must include a reference to the specific method of compliance used. If the operator uses an alternate method of compliance (AMOC) to comply with an AD, the method of compliance means a description of this AMOC and a copy of GACA's approval.

**NOTE:** The operator must not confuse the listing of the current status of an AD or method of compliance with an AD record of accomplishment, which is a description of the work and who performed it and/or issued the approval for return to service.

6) The current major repairs and alterations of each airframe, engine, propeller, and appliance. A listing means a record that contains at least the following information:

- a) A listing identifying each major repair and major alteration, including the item associated with the installation.
- b) A description of, or reference to, the GACA approved technical data used to make the major repair or major alteration.

**NOTE:** The listing of the current major alterations refers to summary current status information. The operator must not confuse this with a major alteration report, which is a description of the work performed, a description of the GACA approved technical data used to make the major alteration, and the identification of the individual who performed and/or issued the approval for return to service. The operator must not confuse this listing with the requirement to submit a copy of each report of a major alteration to the GACA.

7) All the records necessary to show that all requirements for the issuance of an Airworthiness Release Form have been met. These records support the use of an Airworthiness Release Form, which is not part of the aircraft maintenance logbook. While the regulatory requirement for these records does not provide a detailed list of these records,

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this requirement generally means:

- a) Detailed records of all scheduled maintenance that work of equivalent scope and detail has not superseded.
- b) Detailed records of the last overhaul for items that required an overhaul.

**NOTE:** Regulations do not require an overhaul record to contain a record of AD accomplishment. The regulations require separate records of AD current status. The regulations also require that the record of AD accomplishment be kept, but for only 1 year.

- c) Detailed records of all unscheduled maintenance that work of equivalent scope and detail has not superseded.
- d) Copies of the Airworthiness Release Form that covers the last 60 days of operation.

**I. Other Required Records and Reports.** GACA regulations require operators to make other reports and records. The operator can use these records and reports to review its maintenance operations to determine the adequacy of the maintenance portion of the operator manual and the effectiveness of the elements of its maintenance program. These records are one of the sources of information for the operator's CASS. The GACA also uses these reports in its continuous oversight of the operator's maintenance program activities.

1) *Maintenance Log.* GACAR § 121.1541 requires any person who takes action in response to a reported or observed failure or malfunction to make a record of that action in the maintenance log of the aircraft. These operator maintenance log entries correspond to the maintenance recording requirements of GACAR § 43.11(b). Operators also must ensure that each pilot in command (PIC) ensures that all mechanical irregularities occurring during flight time get entered in the maintenance log at the end of that particular flight time, consistent with GACAR § 121.1193.

2) *Airworthiness Release Form or Log Entry.*

- a) The operator's Airworthiness Release Form or Log Entry required by GACAR § 121.1545 corresponds to the approval for return to service requirements of GACAR §§ 43.7, 43.9(e) and 121.663(b). Also, GACAR Part 121 requires the operator to prepare either an Airworthiness Release Form or Log Entry before it can operate its aircraft after

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it, or persons performing maintenance for it, performs any maintenance, preventive maintenance, or alterations.

b) The operator's approval for return to service certification and documentation required by GACAR § 121.1545 is a singular requirement, but the operator may execute it in one of two ways:

1. The operator may complete an Airworthiness Release Form and give it to the PIC. If it uses an Airworthiness Release Form, the operator must keep it separate and distinct from the aircraft log and not include it in the maintenance records. The separate and distinct requirement corresponds to the requirements in GACAR §§ 121.699(a)(1) and 121.1545(d). In modern day environments, operators are most likely to use the log entry method to comply with GACAR § 121.1545. Other than form or format, there is no legal or technical difference between an Airworthiness Release Form and a Log Entry.

2. If the operator makes a log entry, it does not have to issue an Airworthiness Release Form. To avoid confusion and to be consistent with the regulations, the operator should not identify this entry in the aircraft log as an Airworthiness Release. Few operators use a separate Airworthiness Release Form.

c) Consistent with GACAR § 121.1545(e), the operator may include a statement in its manual that the signature in the aircraft log of an authorized, appropriately certificated individual constitutes an approval for return to service under its operator maintenance program. This authorized signature constitutes the four operator approval for return to service certifications without restating each one of the certifications. The operator must prepare its Airworthiness Release Form or Log Entry in accordance with procedures in its manual, and must include the following four certifications consistent with statutory considerations for operations with the highest degree of safety in the public interest:

1. The person performing the work followed the requirements of the operator's manual

2. An authorized person inspected all required inspection items and determined the satisfactory completion of the work performed

3. No known condition exists that would make the aircraft un-airworthy

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4. Concerning the work performed, the aircraft is in condition for safe operation

- d) An appropriately certificated individual who the operator authorizes to make the Airworthiness Release Form or Log Entry on the operator's behalf must sign the Airworthiness Release Form or Log Entry.

**NOTE:** An authorized mechanic or repairman must accomplish the Airworthiness Release Form or Log Entry on the operator's behalf under its Part 121 certificate authorizations. This is consistent with the requirements and authorizations of GACAR §§ 43.9(e), 121.663(b) and § 121.15445(b)(3).

**NOTE:** Consistent with the regulations, no individual may issue an Airworthiness Release Form or make a maintenance log entry unless the operator has authorized them to do so.

**NOTE:** Because a GACAR Part 145 repair station is not a mechanic or repairman, the regulations preclude accomplishment of the operator's Airworthiness Release Form or Log Entry by a GACAR Part 145 certificated repair station. With one exception, an authorized, certificated individual must execute the Airworthiness Release Form or Log Entry as described in Part 121 and according to the operator's procedures. A repair station may employ the authorized individual, but they are acting on the operator's behalf, not on behalf of the repair station. This is consistent with GACAR §§§ 43.9(e), 119.1(c) and 121.1(a) (1)(2).

- e) The operator's maintenance manual should include detailed procedures for accomplishing the Airworthiness Release Form or Log Entry following the accomplishment of any maintenance. The procedures should include processes designed to ensure that the operator does not operate its aircraft following the accomplishment of any maintenance, preventive maintenance, or alteration, unless it, or the person with whom the operator authorizes, completes the Airworthiness Release Form or maintenance Log Entry.

- f) The operator's maintenance manual should include detailed procedures for qualifying and authorizing each individual who the operator has authorized to accomplish its GACAR § 121.1545 Airworthiness Release Form or Log Entry. These procedures should include a positive, readily available means of documenting and transmitting the authorization to the individual, including the scope and limitations of their

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authorization.

3) *Service Difficulty Reports (SDR)*. GACAR § 121.1553 requires operators to make SDRs. While these reports can identify deficiencies within the operator's maintenance program, these reports are the GACA's primary means of gathering information.

4) *Mechanical Interruption Summary Reports (MISRS)*. GACAR § 121.1557 requires operators to make MISRS. These reports document the inability of the operator's aircraft to arrive at its scheduled destination because of mechanical difficulties. This is a prime indicator of deficiencies in the effectiveness of the operator's maintenance program. Moreover, analysis of these reports is one of the GACA's most useful means of oversight of the level of effectiveness of the operator's maintenance program.

**J. Requirements for Reports of Major Alterations and Major Repairs.** GACAR § 121.1549 requires operators to make a report of each major alteration and major repair. The operator must submit the major alteration report to the GACA, and make available the major repair report to the GACA for review. This falls under GACAR § 119.107 requirements. In addition, because it is an operator, it does not have to use official GACA forms to report a major alteration or major repair that it accomplished.

**NOTE:** The operator should not confuse these alteration and repair reports with the current status listing of major repairs and alterations required under Part 121.

### **K. Requirements for Historical or Source Records.**

1) Operators do not have to keep historical or source records to prove that its required records—such as current status records that the operator must make, keep, and make available to the GACA—are true and accurate. Inherent with the requirements and objectives of its maintenance program, the operator must have a system to prepare, store, and retain its required maintenance records; it must monitor that system under its CASS to ensure that persons performing maintenance follow its procedures and that the procedures are effective. This ensures that the operator's required records are true and accurate. Records such as the in-service history of life-limited parts (traceability back to birth) or the record of accomplishment of an AD do not need to be kept indefinitely. There are severe criminal penalties for falsifying or failing to make, or keep, operator records.

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2) Consistent with the GACARs, unless there is evidence to the contrary, an aircraft maintenance record produced by the operator's maintenance recordkeeping system should be acceptable by itself, without other historical or source records. The important consideration here is that the operator has a sound and properly working recordkeeping system. The operator may wish to archive certain source documentation records that it used to introduce parts or components into its maintenance system. These records may include documents such as the manufacturer's invoice for new parts, export certificates of airworthiness, documentation of a major repair or alteration, or other similar information that may be useful in the future. The operator may also have business reasons to maintain historical records, but business reasons would not relate to the absence of any GACA regulatory requirements for historical records. The only records that the regulations require the operator to make and retain are those records specified in the GACARs.

### **4.3.1.23. CONTRACT MAINTENANCE.**

#### **A. Responsibility for Maintenance Performed by Others.**

1) Consistent with GACAR § 121.1(a)(2), when an operator uses a maintenance provider to accomplish all or part of the maintenance activities on the operator's aircraft or its component parts, that maintenance provider becomes, in effect, part of the operator's maintenance organization and under its control. However, GACAR § 121.659 makes it clear that the operator remains primarily responsible for all of the maintenance performed by that maintenance provider on the operator's aircraft. The operator must determine that the maintenance provider has the capability to do its work on the operator's behalf, direct their work, and determine that their work was done satisfactorily according to the operator's manual and its standards. Because the maintenance provider must perform all work on the operator's aircraft in accordance with the operator's maintenance manual and its maintenance program, the operator must also provide the maintenance provider with appropriate material from its maintenance manual for that work.

2) The operator must ensure that the maintenance provider follows the procedures in its manual that it provided. The operator should accomplish this through work-in-progress audits while the maintenance provider is accomplishing the work. The operator's manual system should accommodate work performed for it by each maintenance provider. The policy and procedures portion of the operator's maintenance manual should assign clear authority and responsibilities, and outline procedures for its personnel to administer, control, and

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direct all contracted work. The technical material that the operator provides should be arranged for the use and guidance of the maintenance provider. When possible, the operator should have a written contract with anyone performing maintenance work for it on a continuing basis. This will help ensure that the operator addresses its responsibilities. In the case of major operations, such as engine, propeller, or airframe overhaul, the contract should include a specification for the work. The operator should include or reference that specification in its manual system.

**B. Unscheduled Maintenance Performed Away from Regular Facilities.** Sometimes, an operator will need maintenance performed on its aircraft while it is away from the operator's regular maintenance facilities. The operator also may need maintenance services on short notice. The operator's maintenance manual should include procedures for obtaining these services under these unanticipated conditions. The operator should never use the term "emergency maintenance" to describe short notice, unscheduled maintenance, as those terms imply to its workforce that it does not have to follow the GACARs and the operator's procedures. Emergency means that a serious situation has occurred unexpectedly, involves a peril to life or property, and demands immediate action. An out of commission aircraft parked on an aerodrome ramp could hardly constitute a peril to life or property. The operator should outline the procedural steps it will take to control and direct the required unscheduled maintenance. Unscheduled, short-notice requirements for maintenance do not void the operator's responsibility to determine that its maintenance provider has the organization, adequate facilities and equipment, competent personnel, and appropriate portions of the operator's manual for the work that needs to be done. These determinations must be made before any maintenance provider starts to work on an operator's aircraft. These procedures and determinations should be in the operator's manual.

**C. Airworthiness Release Form or Aircraft Log Entry.** GACAR § 121.663(b) authorizes the operator to approve its aircraft, airframes, aircraft engines, propellers, or appliances for return to service after the operator accomplishes any maintenance, preventive maintenance, and alterations. GACAR § 121.1545 outlines requirements for those personnel making a Log Entry or issuing an operator Airworthiness Release Form under Part 121. These regulations require a certificated repairman, or certificated mechanic that the operator authorizes, to make the Log Entry or issue the Airworthiness Release Form for the operator. These regulations clearly do not authorize a repair station certificated under GACAR Part 145 or any other entity to make an Airworthiness Release Form or Log Entry on the operator's behalf. The regulations set forth clear personnel qualification requirements for each individual the operator so authorizes. The approval for return

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to service authority remains solely with the operator. An individual may not issue an approval for return to service for an operator's aircraft unless the operator authorizes them to do so.

- 1) The operator must designate each individual authorized to execute the Log Entry or Airworthiness Release Form for the operator by name and occupational title. The individual making the Log Entry or Airworthiness Release Form acts as the operator's authorized agent. He certifies the accomplishment of maintenance to the operator's maintenance manual and maintenance program procedures, and that no known condition exists that would make the aircraft un-airworthy. This arrangement does not reduce the responsibility of maintenance personnel to accomplish maintenance functions or tasks in accordance with the operator's manual.
- 2) Consistent with GACAR § 121.1545(b)(1), the operator must include in its maintenance manual the procedures for making an aircraft Airworthiness Release Form or Log Entry. Regulations require the operator to make a Log Entry or Airworthiness Release Form before the operator can operate its aircraft for any reason after the operator has accomplished any maintenance. Other than form or format, there is no legal or technical difference between an Airworthiness Release Form and a Log Entry.

**D. Evaluating New Contract Maintenance Providers.** Before an operator may use a maintenance provider for the first time, it must determine that the maintenance provider candidate complies with pertinent requirements of Part 121. In most cases, the operator would conduct an onsite audit. The operator must demonstrate, through this audit or by some other means, that the maintenance provider has an adequate organization, has adequate facilities and equipment, has competent personnel, and is capable of performing the work under the requirements of the operator's program. The operator should base its determination of whether to accomplish an onsite audit on risk assessment. The risk assessment should take into account the aircraft part failure or system loss of function, and the consequence of the loss of function related to the work that the maintenance provider is accomplishing.

**E. Continuing Maintenance Provider Oversight.** Ensuring that each one of an operator's maintenance providers are in continuous compliance is a major function of the operator's CASS. The operator should use its risk-based process for establishing a schedule for auditing and inspecting each of its maintenance providers. Inherent with a risk-based process, the operator may determine that some of its maintenance providers do not require an onsite audit. Consistent with the "performance" wording of GACAR § 121.691, the audits that the operator accomplishes

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should be primarily work-in-progress audits that determine if the maintenance personnel are following the operator's manual. Trained auditors should accomplish the audits and trained analysts should analyze the results. The results of the analysis should permit the operator to determine each maintenance provider's continuing compliance with Part 121, as appropriate, and the operator's maintenance program.

### **F. Using a Certificated Repair Station as one of the Operator's Maintenance Providers .**

- 1) If the operator decides to exercise its authority under GACAR § 121.663 to make arrangements with other persons to perform maintenance, preventive maintenance, and alterations for it as provided in the operator's manual, the operator may choose to make these arrangements. The regulations do not require the operator to use a GACA-certificated repair station, but they may do so if they choose. The scope of the operator's authorization to make arrangements for maintenance is very broad; it can make these arrangements for maintenance with any "person" as GACAR § 1.1 defines that term. Although the GACAR § 1.1 term "person" includes a certificated repair station, it also clearly does not exclude any other "person" who does not hold a GACA certification.
- 2) The operator regulatory and maintenance program requirements that it would use to qualify a maintenance provider that holds a current GACAR Part 145 repair station certificate are exactly the same as those that the operator would use for a maintenance provider who does not hold a current GACAR Part 145 repair station certificate; there is no difference. Consistent with GACAR § 119.1(c), 121.1(a)(2) each "person," whether certificated or not, that the operator uses or employs for any maintenance, preventive maintenance, or alteration of the operator's aircraft must comply with the Part 121 requirements and the operator's maintenance program requirements, not with GACAR Parts 66 or 145 requirements.
- 3) Further, the operator's GACAR § 121.663(b) authorization to approve its aircraft for return to service after maintenance extends to the work accomplished under the operator's GACAR § 121.663(a) authorization to make arrangements with other "persons" for maintenance.

#### **4.3.1.25. PERSONNEL TRAINING.**

**A. Maintenance Program Training Requirements.** The operator can find its specific operator maintenance training requirements in certain sections of GACAR Part 121. GACAR § 121.695

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requires operators to have a training program that ensures that it has fully informed each person (including inspection personnel) who determines the adequacy of work done about procedures, techniques, and new equipment in use. The program must also ensure the competency of each person relating to the performance of his duties. There is an additional implied training requirement in GACAR Part 121 based on the operator's responsibility to provide competent personnel for the proper performance of its maintenance program. A training program is the logical means for ensuring that maintenance personnel are competent. GACA regulations allow operators to develop a training program that fits its particular needs.

**B. Types of Training.** Some of the possible types of training in an operator's training program are initial training, recurrent training, specialized training, competency-based training, and maintenance provider training. Operators should base its selection of the appropriate training for its personnel, including its maintenance provider personnel, on an assessment of training needs. This assessment is a reflection of the required knowledge, skills, and ability to properly accomplish a given task or function with the highest regard to safety and the current capability of those who the operator would assign to the task or function.

### C. Initial Training.

1) The operator should provide initial training right after it hires a person, or when its personnel begin to work on new equipment or on a new assignment. The operator's initial training program may include subjects such as:

- Employee indoctrination or orientation
- Maintenance department policies and procedures
- Maintenance recordkeeping and documentation
- Aircraft systems or ground equipment
- Specific skills (for example, avionics, composite repair, aircraft run-up and taxi)
- Skills upgrade
- Human factors

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- Task-specific training

- Dangerous Goods

2) The operator's initial training should also include a competence-based assessment of employees. This evaluates an employee's previous training and experience, and helps to identify his specific individual training needs. The goal is to provide training that addresses the gap between required competence and the competence an individual already has.

**D. Recurrent Training.** Recurrent training is education occurring on a repetitive basis. The operator must provide maintenance personnel with the information and skills necessary to maintain its standard of competence. This training also accommodates the introduction of new aircraft, aircraft modifications; new or different ground equipment; new procedures, techniques, and methods; or other new information. The operator's recurrent training, although occurring on a repetitive basis, may not adhere to a defined schedule. Operators should not provide repetitive information in recurrent training unless it is needed to maintain the desired degree of competence. An operator's recurrent training may include:

- Continuing competency training designed to maintain regulatory and certificate currency requirements
- Refresher training on a seldom accomplished task or seldom used skill
- Update training for particular tasks or skills. Update training can include training bulletins, bulletin board items, self-study tasks, and computer-based instruction
- Any other continuing education or training that the operator may not provide on a defined schedule

**E. Specialized Training.** The operator's specialized training should focus on competence in specific tasks or areas of responsibility, such as an RII, bore scope, nondestructive testing, or flight control rigging. The operator might provide this training with initial or recurrent training. The operator does not need to limit it to maintenance subjects, but instead may include management skills training for new supervisors, computer skills, or other training necessary because of a change in an individual's duties and responsibilities.

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**F. Maintenance Provider Training.** An operator's training program must provide appropriate information to each employee of a maintenance provider about its specific program. The training should include function-specific training appropriate to each person's job assignment or area of responsibility. The operator does not need to provide training to maintenance provider personnel in areas that do not concern them. For example, the regulations do not require training on aircraft log procedures and MEL procedures for aircraft interior cleaners, but they do require training for maintenance personnel assigned to on call maintenance for the operator.

**NOTE:** If the operator's maintenance provider has specific types of training for its personnel, the air carrier does not need to duplicate that training for those individuals. However, the operator must ensure its maintenance provider actually has provided the training and that the training meets the operator's own needs and training standards. This could be a CASS work-in-progress audit.

**G. Competency-Based Training.** Although operators historically have provided a specified number of maintenance training hours to ensure employees have the competencies needed for their jobs, studies have shown that it may be better for the operator to train to a competency based standard. The operator does not have to perform this type of training on a defined schedule or for a specific number of hours. Rather, the operator should test each individual to evaluate what training he needs, and then use these evaluations to identify those personnel who retain a high level of subject competence and who may not require a particular block of instruction. Conversely, the operator also should identify those individuals who require more training. Training to competence permits an operator to tailor training programs to the specific requirements of its individual maintenance personnel and maintenance providers.

1) The operator can use competency-based training to raise an employee's level of competence to that level required by the individual's duties and responsibilities. Operators should have procedures to determine when an individual requires competency-based training. An operator may determine the need for this type of training through pre- or post-employment testing, or through the analysis and corrective action functions of its CASS. If an operator uses competency-based training, it should specifically address the lack of competence. In some instances, competency-based training may consist of an appropriately knowledgeable person simply reviewing procedures with an employee through on-the-job training. The operator should design competency-based training to fix an immediate knowledge or skill deficiency, and the training may focus on one individual or a small group. The operator may include competency-based training in its initial or recurrent

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training requirements.

- 2) For those circumstances where the operator identifies a competency deficiency through the investigation of an event, the operator's competency-based training should show an individual what happened, why it happened, and demonstrate, in a positive manner, how to prevent it from happening again.
- 3) The operator should orient its competency improvement training toward correcting personnel competence deficiencies that the operator may identify through its CASS.

### **4.3.1.27. TASK OUTCOMES.**

**A. Complete the GAR.**

**B. Complete the Task.** Successful completion of this task will result in the acceptance of the CAMP program or revision and the issuance of OpSpec D72, Continued Airworthiness Maintenance Program (as applicable).

**C. Document the Task.** File all supporting paperwork in the operator's office file.

### **4.3.1.29. FUTURE ACTIVITIES.** Normal surveillance.

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#### **CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125**

##### **Section 2. Evaluate Required Inspections in a Continuous Airworthiness Maintenance Program (CAMP)**

###### **4.3.2.1. GACA ACTIVITY REPORT (GAR).**

A. 3330 (AW) (Evaluate CAMP)

B. 3341 (AW) (Evaluate Inspection Training)

**4.3.2.3. OBJECTIVE.** This section, along with Section 1, provides information and policy for evaluating the required inspections in an operator's Continuous Airworthiness Maintenance Program (CAMP).

**4.3.2.5. GENERAL INFORMATION.** The operator uses required inspections to verify the proper performance of certain items of maintenance on its aircraft. The items of maintenance include at least those that if performed improperly or improper parts or materials are used, could result in failure, malfunction or defect that would endanger the safe operation of the aircraft. For the purposes of this section, proper maintenance means maintenance and alterations performed in accordance with the operator's manual as required by the General Authority of Civil Aviation Regulation (GACAR ) § 121.683.

###### **4.3.2.7. REQUIRED INSPECTION ORGANIZATION.**

###### **A. Organization and Separation of Maintenance and Inspection Functions.**

1) GACAR § 121.675 contains the organizational requirements for the operator and each person used by an operator to perform maintenance, preventative maintenance, alterations, and required inspections. The organization must be adequate to perform the work. "Work" referenced in the regulation means maintenance.

2) GACAR § 121.675(b) requires the operator and each person with whom it arranges for the performance of required inspections to have an organization adequate to perform the

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work. The inspection organization is responsible for determining that workmanship and materials used conform to the regulations and the operator's manual. "Work" referenced in paragraph (b) means required inspection work.

3) GACAR §121.675(c) adds an additional organizational requirement for organizing the performance of the maintenance function and the required inspection function so as to separate the inspection functions from the other maintenance, preventative maintenance, and alteration functions. The separation must be below the level of administrative control at which persons exercise overall responsibility for the required inspection function and other maintenance, preventive maintenance, and alteration functions.

4) In making the determination of an adequate organization, it is important to note that the regulations do not specify the number of required inspection personnel the operator or other persons must, or can, have. Additionally, GACAR §121.675(c) recognize that the operator or other persons can use personnel for both maintenance and required inspections. In determining organizational adequacy, the operator and aviation safety inspector (Inspector) should consider the regulatory phrase "adequate to perform the work."

**NOTE:** The operator should also consider the additional and related requirements of GACAR §§ 121 Appendix G and 121.687(b) when making its determination of organizational adequacy.

### B. Under the Supervision and Control of the Inspection Unit.

1) GACAR § 121.687(b) requires that no person may allow any person to perform a required inspection unless, at that time, the person performing that inspection is under the supervision and control of the inspection unit. The operator and Inspector should note that the regulation directs compliance at the person with authority and responsibility for allowing (assigning or directing) another person to perform the required inspection. This person might be a manager, supervisor, or maintenance controller that assigns work. This person is responsible for ensuring that the person he assigns or allows to perform the required inspection is under the supervision and control of the inspection unit at the time he performs the required inspection. This requirement is normally not a problem for operators or the other persons that have full-time or dedicated required inspection personnel. However, in cases where the operator or the other person uses personnel for both maintenance and required inspection work, there must be an actual change in the control of

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that person from the control of the maintenance unit to the control of the inspection unit. Additionally, if the operator allows its maintenance controllers to assign required inspection tasks, there must be a mechanism (control) in place that assures that the person performing the required inspection is under the supervision and control of the inspection unit not the maintenance controller or maintenance unit. The operator must describe in its manual how it and other persons will comply with this requirement. It is important for both management and maintenance personnel to know and understand this principle and recognize the authority and control of the inspection unit for required inspections.

2) The second part of the regulation pertains to the supervision of the person performing the required inspection by the inspection unit. Although the regulation does not specify a requirement for an inspection unit supervisor, it is both logical and apparent in the reading of the regulation. Additionally, it is supported by the requirements in § 121.675(b) for an organization adequate to perform required inspection work. The supervisor can be the Chief Inspector or any other person the operator chooses. However, it is important that the supervisor be separated from the maintenance unit in responsibility, authority and interest to assure the independent nature of the required inspection. The operator must describe in its manual the requirements necessary to ensure compliance with this regulation for itself and other persons that perform required inspections for it.

### 4.3.2.9. MANUAL REQUIREMENTS.

**A. Organizational Chart or Description.** GACAR Part 121, Appendix G requires the operator to put in its manual a chart or description of its required inspection organization required by GACAR § 121.675(b) plus a list of persons with whom it has arranged for the performance of its required inspections, including a general description of that work. The operator must keep this information current and available to the General Authority of Civil Aviation (GACA) for inspection. It must be readily available for use by the operator's personnel that need this information to perform their jobs, such as persons involved in contract maintenance, persons involved with the repair of parts, or persons involved with training or auditing.

**NOTE:** The operator may not grant any person required inspection authority for any reason without complying with all applicable required inspection regulations including the listing of persons in the manual. There are no exceptions from the regulations for instances of unscheduled maintenance away from a maintenance base. The certification holder should not use terms such as “one-time RII authorization/authority” to indicate or imply a deviation

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from regulations or their required inspection standards.

### **B. Designation of Items of Maintenance and Alterations as Required Inspection Items (RII).**

1) GACAR Part 121, Appendix G requires the operator to designate maintenance and alteration tasks as RII and list them in its manual. RIIs must include at least those maintenance and alteration tasks that, if not properly performed or if done with improper parts or materials, could result in a failure, malfunction, or defect that would endanger the continued safe flight and landing of its aircraft. When determining maintenance and alteration tasks as RIIs, it is important that the operator consider and account for the phrases, “at least those,” “that could result,” and “improper parts or materials.”

**NOTE:** Due to the varied maintenance systems used and different configurations of the same model of aircraft operated by the various operators, the regulations do not include a listing of the items, which the operator must inspect on each aircraft. Each operator must determine the list of RIIs and include them in its manual.

2) RIIs relate directly to flight safety. Therefore, the operator should consider all of its RIIs with the same safety of flight consideration and emphasis, even if accomplishing an individual RII adversely affects its flight schedule or relates to a scheduled or an unscheduled task or arises at an awkward time or at an inconvenient location. The operator must base its methods for determining its RIIs on regulatory requirements and sound principles. Personnel responsible for making the RII determinations must be qualified to determine such things as failure consequences resulting from improperly performed maintenance, alterations, and the use of improper parts and materials. The operator should identify the person(s) authorized and accountable for determining RIIs. The operator might consider using the expertise of the aircraft manufacturer and manufacturer’s instructions from the technical maintenance documents that are reflected as notes, cautions, warnings, comments, alerts, or otherwise identified as significant steps in the maintenance task. These are a good indication that there are aspects of the maintenance task that if done improperly could result in creating an unsafe condition. Additionally, in the U.S. the National Transportation Safety Board’s (NTSB) Aircraft Accident Database & Synopses contains accident information relating to RII failures, which can be useful. However, the responsibility for determining and listing RIIs remains with the operator.

3) In order to maintain its significance, the list of RIIs should not be over-inclusive. Instead,

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the operator should identify specific items of inspection for each aircraft (it is inappropriate to designate entire systems as RII).

4) Some examples of items that may call for required inspections are proper torque and retainment device installation for engine and landing gear mounting hardware; correct travel, cable routing, tensioning, hardware fitting/torque and retainment device installation for flight control surfaces; and certain emergency equipment installations for post-installation activation and rigging.

5) Each operator must evaluate its maintenance program to identify RII. The operator may identify such items with the abbreviation “RII,” an asterisk, or any similar method.

**C. Method of Performing Required Inspections.** GACAR Part 121, Appendix G requires the operator to include in its manual the method of performing required inspections. The method is the way, technique, manner or process used to perform the required inspection. Methods can be visual, functional, and/or operational, and include such things as tests, checks, measurements, weighing, listening, feeling, tapping, and probing. The method must include any applicable inspection aids or equipment such as a flashlight, mirror, magnifying glass, boroscope, video equipment, rigging gauges and measurement equipment.

**D. Designation by Occupational Title.** GACAR Part 121, Appendix G requires the operator to include in its manual a designation by occupation title of personnel authorized to perform each required inspection. Examples of occupational titles are aircraft mechanic, aircraft inspector, aircraft maintenance supervisor and aircraft maintenance foreman.

**E. Procedures for the Re-inspection of Work Performed Under Previous Required Inspection Findings (Buy-back Procedures).** GACAR Part 121, Appendix G requires the operator to include procedures in its manual for the re-inspection of work performed under previous required inspection findings (buy-back procedures). The operator’s procedures should include how required inspection personnel will document a discrepancy found during the required inspection. Additionally, the procedures should include how maintenance personnel will document the work performed to correct the discrepancy. Finally, the procedures should include how required inspection personnel will re-inspect the work performed to correct the discrepancy. To ensure the performance of the re-inspection the operator should consider adding the procedural requirement to open or note a new required inspection requirement record for each discrepancy found during a required inspection. The operator should be aware that a buy-back

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event could be an indicator of a deficiency in the required inspection program. Therefore, buy-back events should be imputed into the operator's Continuing Analysis and Surveillance System (CASS) for analysis.

**F. RII Procedures, Standards, and Limits.** GACAR Part 121, Appendix G requires the operator to include in its manual the procedures, standards, and limits necessary for required inspections and for acceptance and rejection of the inspected items. GACAR § 121.139(c)(1) requires that the procedures include instructions and information necessary to allow the personnel concerned to perform their duties and responsibilities with a high degree of safety. The operator must clearly define its procedures so that any inspector performing the required inspection will conduct it in a repeatable and consistent manner.

1) The operator should establish when to perform the required inspection. If performed during the maintenance task or part of a scheduled maintenance check, the operator must have controls in place to prevent any subsequent maintenance from invalidating the required inspection. It might be necessary to perform the inspection at a specified step in the maintenance task to prevent such things as skin, panels or doors from covering the inspection item. Similarly, it might be better to perform the required inspection at the end of the task following completion of work. If performed at the completion of the work task, it is vital that the person performing the required inspection get a detailed hand-down from the person that performed the work rather than relying on just the maintenance signoff.

Sometimes, maintenance personnel move, disconnect, or disturb other things to gain access to the intended maintenance or alteration task. Although the required inspection is a focused inspection, the person performing it must be aware of the general condition of the work area. If the inspector is not aware of these things, improper maintenance can go unnoticed. The operator should include in its manual its communication requirements for required inspection and maintenance personnel concerning work performed. Required inspection personnel should not assume that maintenance personnel performed proper maintenance until the inspector can verify the proper performance of maintenance.

2) The operator should clearly identify its RII requirements on work forms, job cards, engineering orders, and the like, or by any other method consistent with its maintenance program. Operators whose programs rely on the use of task cards or job cards to accomplish maintenance and inspections on flight control systems should ensure it bases its procedures and any drawings on the aircraft manufacturer's maintenance manual. Additionally, operators should include discrete (separate or distinct) tasks with individual inspection

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signoff requirements for post-rigging verification.

3) The operator must have those procedures, standards, and limits necessary for the accomplishment of its required inspections and for the acceptance or rejection of each of its RIIs. As the operator will not find RIIs or procedures, standards, and limits for RIIs in an Original Equipment Manufacturer (OEM) manual, it will have to develop these and put them in its manual. The operator should write its RII procedures to inspection personnel and clearly state, at a minimum, what to look at (items of maintenance and alterations), how to look at it (method), what to compare it to (standard) and what is acceptable or not (limits). The operator must provide its required inspection procedures, methods, standards and limits in a useable format for ease of use.

### **G. Procedures to Ensure the Performance of All Required Inspections.** GACAR Part 121,

Appendix G requires the operator to have procedures in its manual for ensuring that all required inspections are performed. The operator should specify who is responsible for completing each step of the required inspection process. The operator should utilize controls in its required inspection program that ensure RIIs are identified, documented and completed prior to releasing the aircraft to service, whether or not the operator performs or other persons authorized by the operator perform the maintenance and inspection. The operator's procedures should state who is responsible for identifying and documenting an RII during both scheduled and unscheduled maintenance and who is responsible. Methods for identifying an RII for a maintenance task can vary, but the operator should require, at a minimum, early identification and documentation of the required inspection requirement and end with a final review of the paperwork at the completion of work and prior to releasing the aircraft to service. A job or task card that includes the RII requirement is a very useful and effective means of controlling the completion of the RII during scheduled maintenance. Procedures and controls also need to account for those instances when an unplanned required inspection is triggered by maintenance and alterations performed. In these cases, the operator should consider the documentation of the required inspection requirement in the aircraft logbook. The operator should require the logbook entry as early as possible in the maintenance task.

### **H. Persons Who Perform Any Item of Work Cannot Perform the Required Inspection.**

GACAR Part 121 requires the operator to include in its manual instructions to prevent any person who performs any item of work from performing any required inspection of that work. This includes any person who provides on-the-job training (OJT) to any person who performs an item of work. A primary concept of the RII function is that the person performing the item of work may

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not perform the required inspection on that item of work. The regulation recognizes the importance of the independent nature of the required inspection. As previously stated, it is important that the operator identify required inspection requirements as early as possible during the maintenance task so that everyone is aware of the requirement and supervision or management can take steps to assign an inspector independent of the maintenance task. Regulatory compliance problems are likely to arise during periods of unscheduled maintenance performed away from a company's maintenance facility due to limited resources. Therefore, it is important that the operator address these different situations in its manual and specify its method of control.

**I. Countermand.** GACAR Part 121 requires the operator to include instructions and procedures in its manual to prevent the reversal of any decision of an inspector regarding any required inspection by persons other than supervisory personnel of the inspection unit. Additionally, a person at the level of administrative control that has overall responsibility for the management of both the required inspection functions and the other maintenance, preventive maintenance, and alterations functions may countermand an Inspector's decision. The intent of the regulation is to ensure that only certain responsible and accountable persons countermand any inspector's decision regarding a required inspection if necessary. The operator should include in its manual the positions (titles) it authorizes within its organization to countermand an inspector's decision. Additionally, the manual should include procedures for documenting the countermand including signatures and the basis or reason used for the countermand.

**NOTE:** Although the regulations recognize this check-and-balance type element in the required inspection process, its use could be an indication of a serious problem or deficiency in the certificate holder's organization. It could be an indication of such things as a poor safety culture, inadequate scheduling of maintenance, inadequate training or experience of inspection personnel, or deficient required inspection procedures. To ensure its proper use, the operator should include the countermand event in its Continuing Analysis and Surveillance System (CASS).

**J. Work Interruptions.** GACAR Part 121, Appendix G requires the operator to include procedures in its manual for ensuring the completion of required inspections interrupted because of shift changes or similar work interruptions before the release of the aircraft to service. Planned or unplanned interruption to required inspections poses a high risk to the safe operation of the aircraft. To mitigate the risk, the operator should provide required inspection personnel with initial and recurrent maintenance resource management training that includes human factor training. Additionally, a simple but effective control for ensuring the completion of required

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inspections is the use of work forms designed for the recording of any interruptions during the required inspection. This form should be part of the work package for the aircraft and the operator or persons performing work for it should review the form prior to releasing the aircraft to service. Another effective control for interruptions is the use of hand-downs, both verbal and written. Whatever method used, the operator must document it in its manual and include the necessary provisions for other persons performing required inspections for the operator.

**K. Other Persons Performing Required Inspections.** As provided in the regulations, the operator may arrange with other persons for the performance of required inspections on its aircraft. However, this does not relieve the operator from its responsibility for compliance with required inspection regulations and its manual. Therefore, if the operator uses other persons to perform required inspection, it must describe in its manual in sufficient detail how it will ensure compliance. There should be no differences in the operator's required inspection requirements for it and the required inspection requirements for its maintenance providers. The operator should consider listing each required inspection regulation and addressing it in its manual both for itself and for a maintenance provider, if applicable. The GACA highly recommends that the operator use a written contract to document clearly and adequately its required inspection requirements with maintenance providers. The operator should locate an adequate number of its qualified and authorized required inspection employees at the aircraft inspection site to monitor the performance of required inspections by others to ensure compliance with written instructions. Notwithstanding the importance of all required inspections, special attention should be given to required inspections involving flight control systems. The operator should establish alternate procedures for those instances when a need arises for a required inspection at the work site and the operator representative is not available. The operator must have a mechanism for the collection of data generated by the performance of required inspections by other persons for input into the operator's CASS to ensure the identification and correction of required inspection program deficiencies.

**L. Certificated, Trained, Qualified, and Authorized.** The operator must have requirements in its manual for selecting, training, qualifying and authorizing required inspection personnel.

- 1) The operator should establish criteria for the selection of required inspection personnel. Because of the required inspection's connection to the safe operation of the aircraft, the operator's standards should be high. The operator should establish a process for identifying and selecting inspector candidates. Mentor programs are useful in providing experience to personnel desiring to become inspectors. The process should focus on individual qualities

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normally associated with quality, such as responsibility, attention to detail, quality work habits, knowledge and experience, ability to focus and stay focused and no history of mistakes or errors. The operator might consider establishing an inspector panel for interviewing inspector candidates.

- 2) The operator must establish specific training requirements for required inspection personnel. Training should be specific to required inspection subjects. It should be a combination of formal classroom training, OJT, and recurrent training. It should also include such things as procedural training, inspection techniques, use of inspection aids or equipment, and human factor training.
- 3) The operator should closely monitor the new inspector for a period following the person's training, qualification, and required inspection authorization. The operator must include procedures in its manual for identifying and authorizing required inspection personnel, both within its organization and within organizations that perform required inspections on its behalf. The operator must ensure it grants RII authorization only to persons trained, qualified, and holding an appropriate airman's certificate.

**NOTE:** Even though an airman certificate is required by regulation, the person with the certificate and performing the required inspection is not exercising the privileges of his certificate. The certificate requirement is a requirement that the operator must ensure. The operator must comply with the requirements of GACAR § 121.655 and ensure the person it uses is appropriately certificated. The certificated person does not get the authority to perform the require inspection from his certificate. The authority comes from GACAR Part 121 and the operator.

- 4) The operator must formally notify each individual of his RII authorization as well as its scope (see GACAR § 121.687(d)). The regulations require that each operator maintain, or determine that each person with whom it arranges to perform its required inspection maintains, a current listing of trained, qualified, and authorized persons who conduct required inspections. The operator must identify the person by name, occupational title, and the inspections authorized to perform. The operator will make the list available to the GACA upon request. The operator or person with whom it arranges to perform its required inspection must give written information to each person so authorized, describing the extent of the person's responsibilities, authorities, and inspectional limitations. Some operators issue cards to required inspection personnel that show the person's authorization and any

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limitations. The use of cards has additional benefits in the control of inspectors such as expiration dates and recurrent training requirements.

**M. Persons Using Other Persons to Perform RII Inspections.** GACAR § 121.687(a) specifies that a person may not use another person to perform required inspections unless they meet certification and training requirements and have been qualified, and authorized to perform the inspection. The operator must provide the method and means for identifying RII inspection personnel meeting the regulatory criteria. The operator should identify in its manual the persons or job positions responsible for assigning or using RII inspection personnel. These persons should be accountable for verifying the regulatory requirements through the means established by the operator. The operator should include this responsibility in the person's job description for both scheduled and unscheduled maintenance and inspections performed by the operator or other persons for the operator.

**NOTE:** The regulation directs compliance with this regulation at the person who uses (assigns or directs) another person to perform required inspection tasks. It applies to both the operator's organization and other persons performing maintenance and required inspections for the operator. Whoever the person is that directs, assigns, or uses another person to perform required inspections is responsible for ensuring that the person they use meets the regulatory and operator's requirements.

**N. Airworthiness Release or Appropriate Log Entry.** GACAR § 121.1545(a) requires the operator or the person with whom the operator arranges for the performance of the maintenance, preventive maintenance, and alterations, to prepare or cause to be prepared an airworthiness release or an appropriate entry in the aircraft log. The person preparing the airworthiness release or log entry must prepare it in accordance with the operator's manual and certify, among other things, that an authorized inspector inspected all RIIs and determined the satisfactory completion of the work. A certificated mechanic or repairman must sign the airworthiness release or log entry. The regulation provides that, instead of stating the required inspection certification requirement, the operator may state in its manual that the signature of an authorized certificated mechanic or repairman constitutes that certification.

**O. Contract Maintenance.** Although the regulations allow the operator to use another person to perform its required inspections, it does not relieve the operator of its responsibility for ensuring other persons perform the required inspections in accordance with the operator's procedures. Based on accident investigation findings on failed required inspections, the GACA highly

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recommends that the operator assign a qualified and authorized employee at the inspection site to oversee the performance of required inspections by other persons. In cases where the assigned operator employee cannot be physically present at the work site such as during multiple shifts, there should be a method of contacting the assigned employee if any questions arise on a required inspection. There are additional requirements for operators who contract out the performance of essential maintenance. Essential maintenance encompasses any on-wing accomplishment of any maintenance or alteration that the operator has designated as an RII. Essential maintenance also includes the accomplishment of the required inspection itself. Essential maintenance does not encompass any off-wing maintenance. The operator must perform required audits prior to using essential maintenance providers. Additionally, the operator must list the essential maintenance provider in its manual.

### **4.3.2.11. TASK OUTCOMES.**

**A. Complete the GAR.**

**B. Complete the Task.** Successful completion of this task will result in the acceptance of the required inspection program or revision and/or a determination that the required inspections are being performed properly and are producing the desired results.

**C. Document the Task.** File all supporting paperwork in the operator's GACA office file.

### **4.3.2.13. FUTURE ACTIVITIES.** Normal surveillance.

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### CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125

#### Section 3. Evaluate/Inspect Fuel Tank System Maintenance/Inspection Program

##### 4.3.3.1. GACA ACTIVITY REPORT (GAR).

A. 3363 (AW) (Initial)

B. 3364 (AW) (Revision)

**NOTE:** In this section, the terms “operator,” “it,” and “its” refer to any certificate holder operating under General Authority of Civil Aviation Regulation (GACAR) Parts 121 or 125.

**4.3.3.3. OBJECTIVE.** This section provides specific guidance for principal maintenance inspectors (PMIs) charged with determining an operator’s compliance with fuel tank system maintenance program revisions based on fuel tank system Instructions for Continued Airworthiness (ICA) developed under the applicable provisions of GACAR § 25.1529 and Appendix H to GACAR Part 25, (including those developed for auxiliary fuel tanks, if any, installed under supplemental type certificates or other design approval).

**NOTE:** This section addresses only fuel tank system safety (FTS) requirements and provides guidance accordingly. Guidance for operator compliance with FTS is contained in the Federal Aviation Administration (FAA)( Advisory Circular (AC) 120-97 (as amended), Incorporation of Fuel Tank System Instructions for Continued Airworthiness into Operator Maintenance or Inspection Programs.

**4.3.3.5. GENERAL.** The applicable FTS regulatory requirements for operators are GACARs are §§ 121.477 and 125.193.

**4.3.3.7. ICA DEVELOPMENT.** TC/STC holders develop all ICAs, which include maintenance and inspection instructions necessary to maintain the existing design features necessary to preclude the existence, or development, of an ignition source within the fuel tank system of each applicable airplane for its operational life.

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### 4.3.3.9. APPLICABLE STCS.

**A. Submission.** In order for operators to comply with the FTS operating rule, they must submit their proposed maintenance or inspection program containing their STC FTS ICAs to their PMI who will compare the operator's FTS maintenance and inspection tasks to the STC holder's baseline ICA contained in the respective amended STC documents. The PMI will then approve the operator's program implementation and issue Operations Specification (OpSpec) D97 Continued Airworthiness Safety Program.

**B. Review Process.** In order to facilitate the reviewing process of the operator's proposed program, the PMI must first be aware of the specific STCs that are "applicable" to the FTS operating rule, and he must know what specific documents contain the FTS ICAs (task and intervals).

**C. Applicable STCs.** The list of applicable STCs, and the associated amendment dates containing the FTS ICAs, is contained in Table 4.3.3.1, List of Applicable STCs.

### 4.3.3.11. OPERATOR REQUIREMENTS TO INCORPORATE MRBR OR MAINTENANCE IMPLEMENTATION DOCUMENT REVISIONS.

**A. Regulatory Requirements.** GACAR §§ 121.477 and 125.193 state that the proposed fuel tank system maintenance program revisions must be based on fuel tank system ICA developed under the applicable provisions of GACAR § 25.1529 and Appendix H to GACAR Part 25, in effect on 6 June 2001. This means that the operator must include in its maintenance or inspection program the TC holder-developed MRBR or maintenance implementation document revisions that include General Authority of Civil Aviation (GACA)-approved fuel tank system tasks and intervals.

**B. Future Revisions.** Normally, throughout the course of an airplane's life cycle the TC holder will make changes to the maintenance program, including the MRBR, the maintenance implementation document, and other maintenance documentation. The operator may also propose changes to its maintenance or inspection program. In accordance with GACAR §§ 121.477 and 125.193 the fuel tank system revisions must be submitted to the GACA for review and approval.

### 4.3.3.13. OPERATOR COMPLIANCE.

In order for an operator to comply with the FTS requirements, it must submit its proposed maintenance and inspection program containing the TC holder's FTS

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ICAs to their PMI. The PMI will compare the operator's FTS maintenance and inspection tasks to the TC holder baseline ICA. The PMI will then approve the operator's program implementation in OpSpec D97. In order to facilitate the reviewing process of the operator's proposed program, the PMI must first be aware of the specific TC holder document (MRBR or maintenance implementation document) revision that contains the GACA-approved FTS ICAs (task and intervals).

**NOTE:** Table 4.3.3.2, Airplane Models with MRBR or Maintenance Implementation Document Fuel Tank Systems, contains the MRBR and maintenance implementation document revisions, by number and date, which contain the FTS ICAs.

**4.3.3.15. AIRPLANES WITH GACA-APPROVED MRBR AND MAINTENANCE IMPLEMENTATION DOCUMENT FTS INSPECTIONS AND INTERVALS.** The airplanes listed in Table 4.3.3.2 have GACA-approved MRBR or maintenance implementation document fuel tank system ICAs. Operators of these airplanes must implement OpSpec D97.

### A. Incorporating the FTS ICAs.

- 1) These GAC-approved FTS ICAs in the MRBR and maintenance implementation documents are based on a “No Unsafe Condition Category,” and the operator must include them in the maintenance program to satisfy the requirements in the operating rule. The incorporation and approval of FTS tasks into the operator’s maintenance program is approved by OpSpec D97.
- 2) If an operator has a particular fleet that does not have “No Unsafe Condition” ICAs to incorporate into its maintenance program, there is no requirement to issue OpSpec D97 for that fleet.

**B. AD-Mandated Airworthiness Limitations.** Airplanes that have AD-mandated fuel tank system airworthiness limitations are based on an “Unsafe Condition Category” and are not required to be documented on, or approved by, OpSpec D97.

**4.3.3.17. TASK OUTCOMES.**

### A. Complete the GAR Record.

### B. Issue OpSpec D97 for affected airplanes.

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**4.3.3.19. FUTURE ACTIVITIES.** Normal surveillance.

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**Table 4.3.3.1. List of Applicable FAA STCs**

<b>FAA STC Number</b>	<b>STC Holder</b>	<b>Airplane Models</b>	<b>Description</b>	<b>Operator Actions</b>
ST00069BO	Goodrich Corporation	DC8-62, -62F, -63F, -72, -72F, -73F	Fuel Quantity Indicating System (External to Tank)	STC Amended 1/5/04, Operators must incorporate ICA T3068-0005-0101, Initial issue, dated Oct 23, 2003 (or later version). (At D check interval, inspections of flight deck wiring and connectors)
ST00020BO	Goodrich Corporation	B747-100, -100B, -100B SUD, -200B, -200C, -200F, -300, B747SP & B747SR	Retrofit of Entire Fuel Quantity Gauging System	STC Amended 10/19/04, Operators must incorporate ICA T3070-0005-0101, Initial issue, dated July 2, 2004 (or later version). (At D check interval, inspections of wiring separation, shielding, bonding)
ST00142BO	Goodrich Corporation	B737-300	Isolation Fuel Quantity Transmitter System	STC Amended 2/10/04, Operators must incorporate ICA T3072-0005-0101, Revision A, dated Jan 22, 2004 (or later version). (Periodic inspections of wiring and bonding)
SA298NE	Goodrich Corporation	B727-100, -200	Computerized Fuel Quantity Indicator System	STC Amended 4/19/04, Operators must incorporate ICA T3066-0005-0101, Revision D, dated March 10, 2004 (or later version). (Inspections to determine the condition of the wiring and connector interfaces, every 16,000 flight hours)
ST00053BO	Goodrich Corporation	B727, -100, -100C, -200, -200F, 727C	FQIS Indicators w/VTO & Optional FSU, In-tank Harnesses	STC Amended 4/19/04, Operators must incorporate ICA T3065-0005-0101, Revision D, dated March 10, 2004 (or later version). (Inspections to determine the condition of the wiring and connector interfaces, every 16,000 flight hours)

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**Table 4.3.3.2. Airplane Models with MRBR or Maintenance Implementation Document Fuel Tank Systems**
**Airbus MRBR Revisions**

<b>Manufacturer</b> <b>Airbus</b>	<b>MRBR Document</b>	<b>MRBR Revision with SFAR-88 Incorporated</b>
A-300 B2/B4	No MRBR A300 All FTS ICAs in ALS	
A-300-600	MRBR Airbus A300-600	Rev 06, dated October 2007
A-310	MRBR Airbus A310	Rev 04, dated October 2007
A-318/19/20/21	MRBR Airbus A318/A319/A320/A321	Rev 12, dated October 2006
A-330	MRBR Airbus A330	Rev 10, dated December 2006
A-340	MRBR Airbus A340	Rev 10, dated December 2006
A-380	MRBR Airbus A380	Rev 01, dated July 2007

**ATR MRBR Revisions**

<b>Manufacturer</b> <b>ATR</b>	<b>MRBR Document</b>	<b>MRBR Revision with SFAR-88 Incorporated</b>
ATR 42-200/300/320	ATR 42-200/-300/-320 MRB Report	Temp Rev TR 02/07, dated November 01, 2007, added tasks for FTS and related inspection requirements
ATR 42-400/500	ATR 42-400/-500 MRB Report	Temp Rev TR 02/07, dated November 01, 2007, added tasks for FTS and related inspection requirements
ATR 72	ATR 72 MRB Report	Temp Rev TR 02/07, dated November 01, 2007, added tasks for FTS and related inspection requirements

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**BAe MRBR Revisions**

<b>Manufacturer BAe</b>	<b>MRBR Document</b>	<b>MRBR Revision with SFAR-88 Incorporated</b>
BAe-ATP	MRB ATP-01 Issue 3	Rev 5, dated May 2008, added tasks for FTS and related inspection requirements
BAe-146/AVRO-(146) RJ	MRB 146-01 Issue 2	Rev 13, dated April 2007, added tasks for FTS and related inspection requirements
BAe Jetstream Series 4100	MRB	Rev 8, dated December 1, 2007

**Boeing MRBR Revisions**

<b>Manufacturer Boeing</b>	<b>MRBR Document</b>	<b>MRBR Revision with SFAR-88 Incorporated</b>
B-707	No MRBR, data is in Maintenance Planning Data (MPD) Document D6-7552 Chapter 10 SFAR-88	Rev dated April 2007
B-727 100/200	D6-8766-MRBR	Rev dated May 2007
B-737-200/300/400/500	737 MRB Section II Appendix F is for B-737-300/400/500 Non MSG-3 Airplanes. Appendix G is for B-737-200 Non-MSG-3 Airplanes	Rev dated May 2007 Rev dated May 2007
B-737-200	D6-82980-MRBR Section 2	Rev dated May 2007
B-737-300/400/500	D6-82981-MRBR Section 2	Rev dated May 2007
B-737 NG 600/700/800/900	D626A001-MRBR Section 2	Rev dated March 2007
B-747-100/200/ 300/SP	747-MRB Appendix III is for B-747 Non MSG-3 Airplanes	Rev dated May 2007
B-747 100/200/300	D6-36737-MRB	Rev dated May 2007
B-747-400	D621U400-MRB	Rev dated December 2007
B-757	D622N001-MRBR Section 2	Rev dated August 2007
B-767	D622T001-MRBR Section 2	Rev dated June 2007
B-777	D622W001-MRBR Section 2	Rev dated April 2007

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### Dornier MRBR Revisions

<b>Manufacturer Dornier</b>	<b>MRBR Document</b>	<b>MRBR Revision with SFAR-88 Incorporated</b>
DO-328 (Turbo Prop)	TM-MRB-010693-ALL	TR-MRB-130, dated Jan 12, 2007, added new MSI (28-00-99) and tasks for FTS and related inspection requirements
DO-328 Jet	TM-MRB-010599-AL	TR-MRB-047, dated Jan 12, 2007, added new MSI (28-00-99) and tasks for FTS and related inspection requirements

### Embraer MRBR Revisions

<b>Manufacturer Embraer</b>	<b>MRBR Document</b>	<b>MRBR Revision with SFAR-88 Incorporated</b>
EMB-120	MRB-HI-200	Original release Rev 23, dated December 01, 2006 and some ATA 28 SFAR-88 task were revised and released under Rev 24, dated October 11, 2007
EMB-145	MRB-145/1150	Rev 11, dated September 19, 2007

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**McDonnell Douglas**

<b>Manufacturer</b> <b>McDonnell Douglas</b>	<b>MRBR Document</b>	<b>MRBR Revision with SFAR-88 Incorporated</b>
B-717	Maintenance Implementation Document ME-717-032	Rev 1, dated October 10, 2008
DC-8	Maintenance Implementation Document ME-8-0006	Rev 1, dated October 10, 2008
DC-9	Maintenance Implementation Document ME-9-005	Rev 2, dated October 10, 2008
DC-10	Maintenance Implementation Document ME-10-034	Rev 2, dated October 10, 2008
MD-10	Maintenance Implementation Document ME-10-026	Rev 2, dated October 10, 2008
MD-11	Maintenance Implementation Document ME-11-016	Rev 1, dated October 10, 2008
MD-80	Maintenance Implementation Document ME-80-016	Rev 2, dated October 10, 2008
MD-90	Maintenance Implementation Document ME-90-043	Rev 3, dated October 10, 2008

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### CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125

#### Section 4. Process-Oriented Maintenance Program to a Task-Oriented Maintenance Program Conversion and Maintenance Steering Group (MSG) -2 to -3 Conversions

**4.3.4.1. OBJECTIVE.** This section provides policy and guidance to General Authority of Civil Aviation (GACA) airworthiness inspectors (Inspectors) with surveillance responsibility for operators with maintenance/inspection programs that have been derived from a Maintenance Review Board (MRB) report.

**4.3.4.3. BACKGROUND.** The primary purpose of an MRB report is to assist the regulatory authorities to determine the initial scheduled maintenance requirements for new or derivative types of transport category aircraft. The MRB report is used as the basis from which an operator develops its own continuous airworthiness maintenance program. MSG-2, -3, or the MRB report is not intended to be used as a controlling document for an operator's program after the initial program is established. One of the specific reasons MSG-3 was created was to eliminate the confusing process oriented maintenance programs. This eliminated confusion associated with various interpretations of condition monitoring, on condition, and hard time, and the difficulties encountered when attempting to determine what maintenance was being accomplished to an item that carried one of the process labels. The goal of MSG-2 and-3 is to produce a scheduled maintenance program that maintains the inherent level of safety and reliability of the aircraft.

**4.3.4.5. ACTION.** Principal maintenance inspectors (PMI) should allow and encourage their assigned operators to utilize the less confusing MSG-3 task type terminology in the maintenance time limitations document rather than the MSG-2 process type terminology. PMIs should also inform their operators of the following program and report changes:

**A. Program Change.** An operator may change a process-oriented maintenance program to a task-oriented maintenance program by changing the words in the maintenance time limitations document to reflect the actual task being performed. This is not considered to be an MSG-2 to -3 conversion since no analysis is being accomplished.

**B. Report Change.** A manufacturer may change an MSG-2 MRB report to an MSG-3 MRB report

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by analyzing all maintenance significant items in accordance with MSG-3 logic. Since there are significant differences between MSG-2 and -3, there is no appropriate formula to change an MRB report from one logic to the other. The MSG-3 analysis must be accomplished to allow the result to be identified as an MSG-3 MRB report.

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**CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125**

**Section 5. Evaluate Continuing Analysis and Surveillance (CASS) Program/Revision**

**4.3.5.1. GACA ACTIVITY REPORT (GAR).**

- A. 3333 (AW) (New)
- B. 3334 (AW) (Revision)
- C. 3635 (AW) (Surveillance)

**4.3.5.3. OBJECTIVE.** This section provides guidance and information on the design, implementation, functions, and other considerations of an operator's Continuing Analysis and Surveillance (CASS).

**4.3.5.5. GENERAL.**

**A. Regulatory Requirements.** General Authority of Civil Aviation Regulation (GACAR) § 121.691 requires an operator with a Continuous Airworthiness Maintenance Program (CAMP) to establish and maintain a CASS. This section also allows the General Authority of Civil Aviation (GACA) to require revisions to an operator's maintenance program based on deficiencies or irregularities revealed by the CASS.

**B. Background.**

1) CASS utilizes a systems-based approach, which permits an operator to identify and understand maintenance program deficiencies well enough to develop and implement permanent solutions for those discrepancies. CASS is a keystone of an operator's ability to maintain airworthy aircraft on a consistent basis.

**C. Definitions (as used in this section).**

1) *Audit.* Scheduled or unscheduled formal reviews and verifications to evaluate compliance

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with policy, standards, and/or contractual requirements.

2) *Authority*. The power to design or change fundamental policy or procedures without having to seek a higher-level management approval. Authority is a permission; it is a right coupled with an autonomous power to accomplish certain acts or order others to act. Often, one person grants another authority to act as an employer to an employee, a corporation to its officers, or as a governmental empowerment to perform certain functions.

3) *Carried Out by the Operator or Other Person*. The operator must maintain operational control over maintenance that any person performs on its aircraft. Operational control includes independently determining the scope and type of maintenance that may be required, when to accomplish that maintenance, and if the maintenance was done in accordance with its manual and program, regardless of who accomplished the maintenance.

4) *Corrective Action*. An action designed to eliminate or mitigate a deficiency that has been identified within the operator's maintenance program.

5) *Deficiency*. A condition which is insufficient or incomplete, or where something required is lacking. In a CASS, it is something that is missing from the operator maintenance program that should be there, or it is something that is there but not producing the desired results. Alternatively, it could indicate that the maintenance program documentation is not being followed. For example, a program element that has failed and is not working, or a program element that has faults and is not working as it should are deficiencies.

6) *Effective*. Producing or capable of producing a desired result. The maintenance program is producing the desired results when the following objectives are realized:

- Airworthy aircraft that have been properly maintained for operations in air transportation
- Competent personnel
- Adequate facilities and equipment
- All maintenance, preventive maintenance, and alterations are always performed in accordance with the operator's maintenance program and manual

7) *Establish and Maintain*. To establish means that the operator develops a CASS that is

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appropriate for the type and scope of its operation. To maintain means that the operator keeps its CASS current and appropriate in response to changes in the type and scope of its operation.

8) *Maintenance Program*. The programs outlined in GACAR § 121.667, other sections of Part 121 subpart J and described in some detail in Federal aviation Administration (FAA) Advisory Circular (AC) 120-16 (as amended), Air Carrier Maintenance Programs.

9) *Maintenance*. Inspection, overhaul, repair, preservation, and the replacement of parts, excluding preventive maintenance.

10) *Performance*. The act of doing something successfully; the successful execution of an action. In the CASS, performance means that the maintenance program is being accomplished or executed as outlined in the operator manual.

11) *Person*. An individual, firm, partnership, corporation, company, association, joint-stock association, or governmental entity. It includes a trustee, receiver, assignee, or similar representative of any of them.

12) *Preventive Action*. Action to eliminate or mitigate the cause or reduce the effects of potential nonconformity or another undesirable situation.

13) *Program*. An organized list of procedures.

14) *Responsibility*. The obligation to ensure that a task or function is successfully carried out. Responsibility includes accounting for actions related to the task or function. This is a key attribute of operational control.

15) *Risk*. Risk is the degree of probability that hurt, injury, or loss will occur over a specific period of time or number of operational cycles. Risk has two elements: severity and likelihood. With regard to operator maintenance operations standards, the relationship between these two elements must be inverse.

a) *Severity*. The type of harm that will be inflicted if a particular event occurs. For operator maintenance programs, severity should be expressed in qualitative terms as a consequence of failure: safety, operational, economic, or environmental.

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b) Likelihood. The estimated probability or frequency, in quantitative or qualitative terms, of an occurrence related to the hazard; an expression of the probability that a specific unsafe event will occur.

16) *Risk Mitigation*. A risk control measure. It refers to the process of modifying the system in order to reduce the risk.

17) *Risk Management (RM)*. A formal process composed of identifying hazards, analyzing risk, assessing risk, and controlling risk. This process is embedded within the processes used to provide the product/service; it is not a separate process.

18) *Root Cause Analysis (RCA)*. The analysis of deficiencies to determine their underlying root cause.

### 4.3.5.7. OVERVIEW OF A CASS.

**A. Functions of the CASS.** CASS functions as an operator maintenance program management tool that includes continuous and methodical monitoring and evaluation of an operator maintenance program. An operator's CASS uses a continuous, system-safety based, closed-loop cycle of surveillance, data collection and analysis, corrective action, and follow-up to continually evaluate the performance and effectiveness of the maintenance program. Through the CASS, the operator ensures that it is performing the right maintenance at the right time and that it produces the intended results. The CASS is one of the tools an operator uses to exercise operational control over maintenance activities conducted on its aircraft.

**NOTE:** It cannot be overstated that the CASS is a system and not a program. The primary responsibility for the CASS should be specific to an individual with the necessary authority, while coordination for the implementation of a CASS might be entrusted to a department.

1) *CASS Monitors Maintenance Program Performance*. The program performance (program execution) part of the CASS ensures that everyone, including all of the operator's maintenance providers, comply with the operator's manual and program and with all applicable regulations.

a) Generally, the program execution part of the CASS functions through a system of audits and investigations of operational events. The operator should consider each

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negative audit and each operational event as an indicator or symptom of a program or systemic failure. The operator should evaluate each one. However, depending on the results of the evaluation (risk analysis and risk assessment), every symptom or indicator may not require corrective action.

- b) The program execution part of CASS should include a continuous cycle of both scheduled and unscheduled (proactive and reactive) surveillance and investigations, data collection and analysis, corrective action, and follow-up surveillance.
- 2) *CASS Monitors Maintenance Program Effectiveness.* The program effectiveness part of a CASS ensures that the maintenance program is producing the desired results. Primary indicators of the level of maintenance program effectiveness are the level of unscheduled maintenance and the rate of availability of the aircraft for use in air transportation.
  - a) Generally, the program effectiveness part of the CASS functions through a system of data collection and analysis of operational data that results from operation of the aircraft. An operator should collect operational data and equipment failure data, which measures the output (results) of the maintenance program.
  - b) Since one of the primary objectives of a maintenance program is to produce airworthy aircraft, data sets such as the rate of aircraft availability, the rate of unscheduled landings, and the rate of schedule and dispatch reliability are useful for this purpose. An operator can collect this data in relation to a particular aircraft or a particular fleet.
  - c) While the GACA does not mandate the specific data an operator should collect, the GACA does expect an operator to have an effective process designed to select appropriate, relevant, and useful types of collected data. This data selection process should also ensure that any data collected is useful for its intended purpose. Moreover, a periodic review of the type of collected data ensures that the collected data remains appropriate, relevant, and useful.

**B. How CASS Does It.** The CASS enables an operator to detect and correct discrepancies in all elements of its maintenance program by proactively looking for indicators and symptoms of deficiencies and reactively looking at the results of deficiencies. CASS monitors maintenance program performance and effectiveness through a systems approach using a closed-loop system of four major activities:

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- Surveillance
- Data analysis
- Corrective action
- Follow-up

**C. CASS Surveillance and Analysis.** The regulations require that a CASS accomplish surveillance and analysis of the operator maintenance program from two perspectives: performance and effectiveness. An operator conducts the first two activities in the CASS (surveillance and analysis) in two different ways. The primary basis for one activity is audits, while the primary basis for the other is operational data collection and analysis. The results of these two types of surveillance and analysis feed into the third and fourth basic CASS activities (corrective action and follow-up). Table 4.3.5.1, The Major CASS Activities, summarizes the flow of the four basic activities of a CASS.

<b>VERIFY PERFORMANCE OF THE MAINTENACE PROGRAM</b>	<b>VERIFY EFFECTIVENESS OF THE MAINTENANCE PROGRAM</b>
<b>1. Surveillance:</b> Audit process. <ul style="list-style-type: none"> <li>• Create a risk-based audit plan.</li> <li>• Perform work-in-progress audits.</li> <li>• Perform transaction audits.</li> <li>• Perform system audits.</li> <li>• Identify hazards.</li> </ul>	<b>1. Surveillance:</b> Data collection process. <ul style="list-style-type: none"> <li>• Select data sets.</li> <li>• Collect operational data.</li> <li>• Collect failure data.</li> <li>• Identify trends, anomalies, and potential hazards.</li> </ul>
<b>2. Analysis:</b> Identify hazards, accomplish risk analysis and assessment.	<b>2. Analysis:</b> Identify hazards, investigate adverse indicators, and accomplish risk analysis and assessment.
<b>3. Corrective Action:</b> Accomplish a Root Cause Analysis (RCA); develop, implement, and monitor a corrective action plan (CAP), as appropriate.	
<b>4. Follow-up:</b> Verify that the corrective action was effective, and initiate risk-based follow-up surveillance planning, as appropriate.	

Table 4.3.5.1. The Major Continuing Analysis and Surveillance System Activities

1) *Surveillance.* The operator conducts surveillance so it can gather information and collect data for use in the evaluation of all elements of its program (including its maintenance

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providers) from two different perspectives: performance and effectiveness.

- a) Surveillance to verify performance involves the use of audits, specifically work-in-progress audits used to make sure the manual and program are being followed.
  - b) Surveillance to verify effectiveness involves the collection of operational data and aircraft systems failure data so that the operator can make conclusions about the degree of effectiveness of the maintenance program.
- 2) *Analysis of Data.* Data analysis is the identification of system deficiencies (hazards) in an operator's maintenance program through analysis of the various kinds of data that the operator has chosen to collect. Data analysis is also used to verify an acceptable level of program performance or effectiveness.
- a) The performance (program execution) analysis function of the CASS is carried out through the analysis of data collected during the accomplishment of audits and investigations. These audits and investigations examine the actual accomplishment of the activities and tasks of a maintenance program element relative to the standard (i.e., the operator manual and the maintenance program). The accomplishment of audits and analysis of audit data serve to measure program execution.
  - b) The effectiveness (intended results produced) analysis function of the CASS is carried out through the analysis of collected operational data. Collection and analysis of operational data allows the operator to measure the output of the maintenance program relative to its objectives.
- 3) *Corrective Action.* CASS identifies deficiencies through analysis of the audit and operational data that it collects. However, based on the risk assessment performed during risk analysis, not all deficiencies will require corrective action. The level of risk might be of an acceptable level. For example, a number of mechanical delays or cancellations may be acceptable in the eyes of the operator. This can be acceptable as long as safety is not compromised.
- a) When a CASS determines a risk to be of an unacceptable level, it will employ risk controls (corrective action) to deal with an identified deficiency and the cause(s) of that discrepancy.

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- b) When a CASS requires the development of a corrective action plan (CAP), it will address the causal factor(s), and provide a solution to prevent recurrence. Within a CASS, an RCA is used to identify the central causes of an event and facilitate effective corrective actions. A CASS will implement and monitor the plan through completion.
- 4) *Follow-up.* Follow-up is the very important function that ensures the corrective action has addressed the deficiency. The follow-up ensures that the corrective action accomplishes what the operator intended it to do and connects the closed loop back to surveillance. Based on the assessment of risk, the operator can perform additional surveillance and/or modify data collection processes.

### **D. Risk Management (RM) in CASS.**

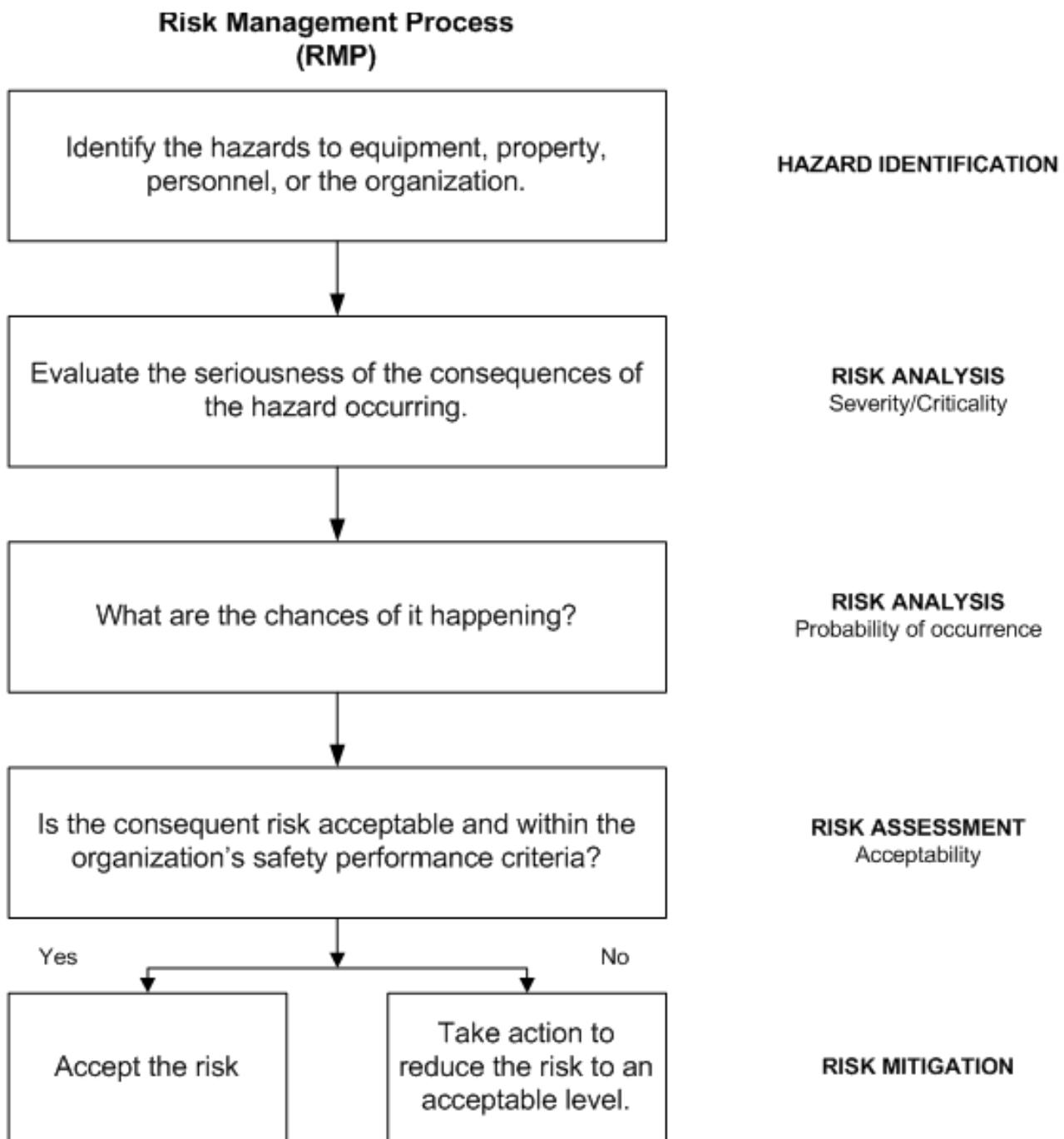
- 1) In concert with the attributes of a good organization, personnel and resources for a CASS should be prioritized as part of the overall risk management process (RMP). RM facilitates the balancing act between assessed risks and practical risk mitigation.
- 2) RM serves to focus safety efforts on those hazards posing the greatest risks. Essentially, any methodology used to prioritize surveillance personnel and resources (as well as to formulate corrective action decisions later in the process) involves principles of RM.
- 3) The following elements compose a formal RMP:

- Identifying hazards
- Analyzing risk
- Assessing risk
- Controlling risk

**NOTE:** The flow chart in Figure 4.3.5.1, Overview of the Risk Management Process, summarizes an overview of the RMP. The elements of an RMP encompass the four major CASS activities found in Table 4.3.5.1 above.

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**Figure 4.3.5.1. Overview of the Risk Management Process**



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**E. CASS in an Operator's Operation.** An operator should tailor its CASS to its individual operation. Therefore, to a large degree, what the CASS looks like will depend on the design of the maintenance organization and the size, complexity, and the level of flight operations of that operator.

- 1) The basic CASS functions are always the same, but the personnel who carry out each function and the manner in which the functions are carried out will be different from one operator to another. For example, an operator with a high level of daily aircraft utilization and a very large fleet of many different kinds of aircraft may have a separate department dedicated to performing CASS activities. On the other hand, an operator with a fleet of 25 aircraft, operating seasonally or weekly, may find it more efficient to use its quality assurance (QA) department to perform CASS activities. An unscheduled operator with few employees and one or two aircraft having an average annual utilization of less than 1,000 hours may contract most of its CASS activities.
- 2) Regardless of the operator's size and level of flight operations, a well-structured CASS helps an operator exercise operational control over maintenance activities. This involves taking a systems approach to enhancing safety and eliminating deficiencies as well as systematically determining the level of performance and effectiveness of its maintenance program. This is a key to achieving operations with the highest possible degree of safety as well as a very high degree of efficiency.

**F. What CASS Examines.** A CASS monitors all 10 elements of the operator's CAMP. A CASS accounts for the consequences of various internal and external influences on the maintenance program. The following are examples of some, but not all, of the items within each element that a CASS looks at. You should note that all of these items are examined by the surveillance of the maintenance program performance function of CASS; this is accomplished through audits. However, in addition to real time events such as accidents/incidents, CASS will address effectiveness discrepancies identified through the collection and analysis of operational data (i.e., RCA).

1) *Airworthiness Responsibility.*

- a) Operators are primarily responsible for the performance of maintenance, including work done by maintenance providers on its aircraft. All maintenance, including work done by outside persons, must be done in accordance with the operator's maintenance

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program and maintenance manual.

b) An air operator certificate makes the operator a maintenance entity. Each person who accomplishes maintenance on an operator's aircraft accomplishes it on the behalf of the operator as an agent for the operator. Consistent with the privileges and limitations of its air operator certificate, operators, through their maintenance organization, are responsible for executing operational control over maintenance activities that anyone accomplishes on its aircraft. It is a requirement for operators to determine when maintenance is required, what maintenance is required, accomplishing the maintenance, determining if the maintenance was done satisfactorily, and approving its aircraft for return to service. Consistent with the regulations, an air operator may not delegate this responsibility to persons used by the operator for any maintenance, preventive maintenance, or alterations.

### 2) *Maintenance Manuals. CASS ensures that:*

- a) The content of all manuals, including maintenance manuals and technical content, is the responsibility of the operator. The basis of the manuals may be the Original Equipment Manufacturer (OEM) manuals or other information, but it is a requirement for the operator to use its own manual, not the OEM manuals.
- b) Manuals, publications, and forms are useable, current, correct, and readily available to all personnel required to use them.
- c) Each person required to comply with the operator's manual has access to it during the performance of normal duties.

### 3) *Maintenance Organization.*

- a) Consistent with the responsibility described above, operators must have a maintenance organization that is able to effectively exercise and maintain operational control over all persons performing, supervising, managing, and amending the CAMP. The maintenance organization must be able to manage and guide its maintenance personnel and provide the direction necessary to achieve overall maintenance program objectives.
- b) The individual with overall maintenance program authority and responsibility is the

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Director of Maintenance (DOM) who functions as the accountable manager for the CAMP. The organization must clearly identify this individual within the organization and the individual must be qualified in accordance with GACAR Part 121. While retaining overall authority and responsibility, the accountable manager may delegate direct responsibility for elements of the program as appropriate for the size and structure of the maintenance organization.

c) The maintenance manual must contain a chart or a description of the maintenance organization showing clear authority and responsibility, including delegated responsibility, for the overall maintenance program and all of its elements and functions. The regulations require the operator to include a description in its maintenance manual of the duties and responsibilities for each position in the organization so that there is not a fragmented organizational system with high risk of confusion over who is responsible for a given task.

d) In order to be effective, an adequate maintenance organization must be able to demonstrate the following four organizational duties:

1. The duty to define the environment within which individuals conduct their tasks.

2. The duty to define the policies and procedures that individuals must follow and respect.

3. The duty to allocate the resources that individuals need in order to achieve safety and production goals.

4. The duty to investigate system failures and take all needed remedial action to avoid a repetition.

e) A maintenance organization will not be successful if it permits the following failures to occur:

1. Failure to understand the effect of people on safety and reliability of aircraft maintenance operations.

2. Failure to organize its employees' work.

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3. Failure to monitor its employees' work effectively.

4. Failure to implement corrective actions.

f) The performance of the RII function(s) must be organizationally separated from the performance of the other maintenance (including inspection), preventive maintenance, and alteration functions. This organizational separation must be below the level of the individual who has primary responsibility for the RII function, other maintenance, preventive maintenance, and alterations functions. In simple terms, this means that the part of the maintenance organization that accomplishes the maintenance (including inspection), preventive maintenance, and alterations function cannot be the same part of the maintenance organization that accomplishes your RII function.

4) *Maintenance Schedule.* The maintenance schedule sets out the appropriate item, task, and interval of the operator's scheduled maintenance effort. The GACA expects the operator's maintenance schedule to be task-based and appropriately modified in accordance with the CASS data collection and analysis findings. The operator accomplishes the initial selection and the continuous validation of each scheduled maintenance task and its associated interval according to well-defined criteria throughout the service life of the item, system, or structure. The maintenance schedule is proactive and designed to permit the item, system, or structure to do what it is designed to do. Notwithstanding design issues, the level of unscheduled maintenance is a primary indicator of the level of effectiveness of the maintenance schedule.

5) *RIs.*

a) The operator must have specific procedures, standards, and limits necessary for the acceptance or rejection of each RII and for periodic inspection and calibration of precision tools, measuring devices, and test equipment. Inspectors are reminded that the OEM's manuals and procedures do not contain RII procedures, standards, and limits and the operator must develop and document these.

b) Personnel authorized to accomplish RII inspections must receive proper training and qualification for each RII task that they receive the authorization to perform.

c) Designated RII inspectors who perform an item of work do not perform the required inspection on that item.

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- d) The maintenance organization separates the performance of the required inspection functions from the other maintenance, preventive maintenance, and alteration functions.
  - e) The manual contains procedures to ensure that only supervisory personnel of an inspection unit or the person who has overall responsibility for the RII function as well as the other maintenance, preventive maintenance, and alteration functions may countermand the decision of any RII inspector regarding an RII.
- 6) *Contract Maintenance.* Vendors and suppliers must have the qualifications and provide services and products according to the operator's maintenance program and manual. There should be no difference between the way work is done by operator personnel or by the operator's maintenance providers.

7) *Personnel Training.*

- a) The operator must have a means to determine that all maintenance personnel, including maintenance provider personnel, are competent to accomplish their duties.
- b) The operator must have a training program for personnel (including inspection personnel and maintenance provider personnel) that determine the adequacy of accomplished maintenance.
- c) The program ensures that personnel are competent to perform their duties.

8) *Accomplishment and Approval of Maintenance.*

- a) Maintenance facilities and equipment, as well as the operator's maintenance providers' facilities and equipment, must be adequate to perform the maintenance. Other than scope and location, there should be no difference in the standards for facilities and equipment between the operator and its maintenance providers.
- b) Maintenance providers must properly store, dispense, identify, and handle parts and components.
- c) Maintenance providers must properly calibrate tools and equipment.
- d) Maintenance providers must identify the requirements for specialized tools or

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training and provide training.

- e) Maintenance providers must perform maintenance and alterations according to methods, standards, and techniques specified in the operator's manuals.
- f) Maintenance provider personnel must properly document work interruptions and deferred maintenance in shift-turnover records, and accomplish them according to applicable procedures.
- g) Maintenance providers properly must classify major repairs and major alterations (consistent with the GACAR Part 1, § 1.1 meaning of major alteration or repair) and accomplish them in accordance with GACA-approved technical data.
- h) If the operator relies exclusively on Appendix A to GACAR Part 43 to make the major/minor classification, it will result in the classification of some minor repairs as major and the classification of some major repairs as minor simply because the list does not cater to all situations.
- i) Appropriately certified mechanics or repairmen, who are authorized by the operator, execute Log Entries and Airworthiness Release Forms.
- j) Maintenance providers must complete log entries and Airworthiness Release Forms according to the operator's written policies and procedures.

### 9) *Maintenance Recordkeeping System.*

- a) Maintenance records and current status records must be generated and retained in accordance with the operator's manual procedures.
- b) Maintenance records and current status records must be complete and correct.
- c) Airworthiness Directives (AD) must be appropriately evaluated, accomplished, and tracked.
- d) Life-limited parts must be identified and the current status time in service is tracked.

### 10) *CASS.*

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- a) CASS has four major activities that ensure, with a system-oriented, structured approach, that all elements of the operator CAMP are properly executed and are consistently effective by design rather than by chance.
- b) Senior management reviews CASS issues on a regularly scheduled basis. Meetings of CASS or maintenance management committees or boards are also held on a regular basis to discuss findings, analysis, and the progress of corrective actions. These meetings may address events, as well as statistical data and trends.

### **4.3.5.9. PREREQUISITES AND COORDINATION REQUIREMENTS.**

**A. Prerequisites.** Knowledge of the requirements of GACAR Parts 5 and 121.

**B. Coordination.** None

### **4.3.5.11. REFERENCES, FORMS, AND JOB AIDS.**

**A. References:**

- AC 120-16 (as amended), Air Carrier Maintenance Programs
- AC 120-79 (as amended), Developing and Implementing an Operator Continuous Analysis and Surveillance System

**B. Forms.** GAR.

**C. Job Aids.** None.

### **4.3.5.13. VERIFY THE CASS ORGANIZATIONAL STRUCTURE.**

**A. Identifying CASS Organization Positions.** Identify the positions within the certificate holder's organization that have authority and responsibility for the CASS. The definitions below have meaning within the context of an operator's organization. Consistent with existing regulations, there should be a chart or description of the CASS organization in the operator's maintenance manual.

- 1) Authority is a *permission* and is the power to create or modify fundamental policy or

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procedures without higher level review or approval. Authority also means the power to accomplish a function, as well as the power to assign responsibility for carrying out the various functions of the maintenance program. The individual with authority for the CASS may design or change the CASS without having to seek approval from a higher level of management. CASS procedures should include a process to modify or revise the CASS.

2) Responsibility is an *obligation* that comes with accountability to ensure the successful completion of tasks and functions in accordance with applicable policies, procedures, and standards. This work may be accomplished directly by the individual with the responsibility, or the responsibility for the work may be delegated. The individual with responsibility for the CASS has the obligation to carry out the functions of the CASS, including overseeing and managing any personnel who are assigned CASS functions and duties. Note that for smaller organizations where personnel share duties and may only carry out CASS functions part-time, this oversight and management responsibility relates only to those part-time tasks.

### **B. Authority and Responsibility.**

1) An individual or position within the maintenance organization should have authority for the CASS, and an individual or position within the maintenance organization should have overall responsibility for managing and implementing the CASS. An individual may have both responsibility and authority for the CASS.

2) That individual might also have responsibility for other functions as well as the CASS. It is common for the individual with responsibility for CASS functions to delegate some or much of this work to others within the organization, depending on the size and staffing of the operator.

3) What the GACA expects is clear responsibility for the overall CASS functions so that there is not a fragmented system with a high risk of confusion over who is responsible for executing a given task or function.

4) The potential exists for a conflict of interest between personnel managing daily operations within the carrier, and those who serve in an oversight role. Personnel with CASS responsibilities and duties should be as independent as possible from the day-to-day operations of the maintenance program. Theoretically, outside personnel contracted to perform such work for the operator conduct the most independent, objective audits.

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5) Operator personnel who are conducting audits should work in separate departments from the departments performing the actual maintenance activities that are being audited.

However, this is not necessarily feasible for small operators. At small operators, personnel performing CASS functions, particularly audits, may consist of one or more of the following:

- a) Borrowed personnel from other shops or departments. The operator's procedures should include ways to avoid having these individuals assigned to audit areas where they normally work.
- b) The SMS management representative named under GACAR Part 5, particularly if there are no other employees and the CASS audits are focused on outside vendors and maintenance providers because all or most of the actual inspection and maintenance work is accomplished through contracts.
- c) Outside resources contracted to perform audits and analysis for the company.
- d) Others deemed qualified by the operator to provide the operator with an independent objective audit, operational data collection, and analysis services that fulfill the requirements of a CASS.

**4.3.5.15. VERIFY THE CASS FUNCTIONS.** Verify the CASS functions concerning RM comply with RM principles described Volume 2 of this handbook.

**4.3.5.17. VERIFY THE CASS FUNCTIONS CONCERNING THE PERFORMANCE OF THE MAINTENANCE PROGRAM.**

### A. Surveillance of the Performance of Maintenance Programs.

1) The main tool for surveying whether the operator and its maintenance providers are properly performing the maintenance program is audits. An audit is a formal examination of the activities of an operator's or maintenance provider's departments or areas as compared to a standard, which is the operator's program as written in its manual. The operator's audits should be designed to measure an operator's and maintenance provider's compliance with their maintenance program requirements. The maintenance program itself must ensure that the maintenance provider accomplishes all maintenance activities in accordance with the processes and procedures of the maintenance program (GACAR § 121.667).

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2) There are four types of audits usually used by operators. Generally, the differences are who accomplishes the audits and who the audit looks at.

- a) Internal audits are performed by operator audit personnel on operator activities.
- b) External audits are performed by operator personnel on activities of outside entities or maintenance providers.
- c) A specific individual or position within a department, shop, or maintenance provider performs self-audits “in-house.”
- d) Third parties (the GACA, Coordinating Agencies for Supplier’s Evaluation (C.A.S.E.), Foreign CAAs, etc.) perform third-party audits on the operator or maintenance provider.

3) There are at least three audit methods used by operators. Generally, the differences are the audit objective and what the audit looks at.

- a) The work-in-progress method audit is the primary type of method that we expect the operator to use. The purpose of these audits is to determine if the worker is following the manual. This is a requirement of GACAR § 121.667(a). A negative finding is a program deficiency under the CASS requirements and must be addressed. This follows the plain language meaning of the CASS regulation (i.e., the performance of the maintenance program; are they doing what the program requires?).
- b) The transaction method is used primarily for reviewing records and serves to see if the maintenance program standard for the record form, record procedures, record completion, and record accuracy standards of the program are being achieved.
- 4) The systems method is a high level, comprehensive, and documented examination of all of the activities, records, processes, and other elements of an operator or maintenance provider’s various systems, to determine their conformity with the requirements of a standard such as the operator’s maintenance program. These audits can also identify various latent faults in the operator’s or maintenance provider’s overall systems. These audits are usually, but not always, accomplished by a professional audit agency and result in a written and detailed report that is used by senior management to make corrections to the systems.

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5) The operator's auditing process should have written procedures that include the scheduling of audits. The CASS must address both internal and external audits.

**NOTE:** If an operator assigns an onsite representative at a maintenance provider, the Inspector should ensure that the operator's CASS procedures cover this individual(s)' surveillance activities. These are classed as work-in-progress audits. Typically, these individuals will observe a noncompliance with the operator's manual and ensure that the maintenance provider corrects the noncompliance usually within that same day. These events must be recorded and input to the operator's CASS documentation system for analysis and evaluation. Otherwise, a pattern of noncompliance with the operator's program and manual may go undiscovered by operator and maintenance provider management personnel.

6) CASS procedures should include a risk-based methodology for determining priorities and for establishing and adjusting audit cycles (for example, 12, 18, 24, or 36-month cycles) so that resources are focused on the most pressing issues. You should note that the RMP may show that a department or maintenance provider self-audit is applicable and effective.

7) Although the majority of the inputs to this process would be generated internally, one additional input may be the results of outside audits of the operator or its vendors conducted by entities other than the operator. For example, the results of audits or inspections conducted by outside entities may be useful by providing an operator with:

- Specific findings requiring an RCA and possible corrective action
- Information useful in focusing the operator's own audits and operational data collection

**B. Scheduling Audits.** The operator may approach this initial scheduling task in many different ways, ranging from resource allocation based on company experience and very basic analysis to the use of a sophisticated, software-supported risk analysis process. Within this range of possible methodologies, expect the operator's CASS audit scheduling procedures to contain processes to systematically make those decisions that are compatible with the size and complexity of its operations.

**C. Safety and Operational Objectives.** Encourage your operator to make this process as structured as possible. The operator should place priority first on safety and regulatory

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compliance, and second on issues of operational efficiency. However, an effective CASS will meet all of these objectives.

1) To identify the areas to audit and to set priorities, the CASS process should include consideration of factors in outside reports. These factors could include inspections, reports, special studies, or audits conducted by outside entities. Outside reports may address:

- Information specific to the operator or its vendors
- Information related to the industry as a whole and of interest to the operator
- Information about an accident, incident, procedure/process, or equipment type that is relevant

2) The operator should equip CASS auditors with checklists to ensure consistency and completeness of audits. The accountable manager for the CASS should ensure that the checklists are updated as needed. The checklists should be written in a manner that evaluates compliance with the 10 elements of the CAMP. An auditor should also be permitted a level of flexibility to ask questions not contained in the checklist if he or she finds an area that requires further investigation.

3) An operator's procedures should include identification of all areas that need to be audited, along with a process for updating this list. The following list presents examples of areas operators should consider for routine audit. A CASS audit should verify that:

- a) Manuals, publications, and forms (paper and electronic versions) are useable, up-to-date, accurate, and accessible to users when they are performing assigned duties.
- b) Maintenance and alterations are performed according to the methods, standards, and techniques specified in the operator's manuals, including ensuring that major repairs and alterations are properly classified and accomplished consistent with technical data approved by the President.
- c) The maintenance provider properly stores, dispenses, identifies, and handles parts and components.
- d) ADs are appropriately evaluated, accomplished, and tracked.

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- e) Aircraft modifications that have been installed as a result of AD requirements have not been removed or modified by subsequent repairs, alterations, or other modifications.
  - f) Maintenance providers generate maintenance records in accordance with manual procedures and are complete and correct.
  - g) RIIs are identified and addressed according to the operator's procedures.
  - h) Authorized individuals execute Airworthiness Release Forms and Log Entries according to the operator's procedures.
  - i) Maintenance providers accomplish shift-turnover records, work interruptions, and deferred maintenance according to applicable procedures.
  - j) Maintenance facilities and equipment, including base and line stations and contract maintenance providers' facilities, are adequate for the work that is to be done.
  - k) Personnel, including those of contract maintenance providers, are qualified and competent to accomplish their duties.
  - l) Tools and equipment are properly calibrated.
  - m) Requirements for specialized tools or training are met, such as for nondestructive testing, Category II/III maintenance, and run-up/taxi.
  - n) Computer programs for the maintenance program are used in accordance with specifications.
  - o) Maintenance providers, vendors, and suppliers provide services and products according to the operator's policies and procedures.
  - p) Each aircraft released to service is airworthy.
- 4) CASS audits should be primarily proactive, searching out potential problem areas before they can result in undesirable events. However, CASS procedures should also address how to direct unscheduled audits in response to events or a series of events. For example, rejected takeoffs, unscheduled landings, in-flight shut downs (IFSD), accidents, or incidents may

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indicate the need for special audits or surveillance under a CASS.

- 5) One of the primary purposes of a CASS is to detect and analyze trends for indications of program weaknesses or deficiencies. For example, CASS auditors would not necessarily audit a single maintenance-related rejected takeoff, although the CASS would investigate the event as part of the reactive function. A CASS would, however, consider whether that instance indicated a need to focus audits on a particular area from the trending proactive point of view.
- 6) Auditors and analysts should maintain informal lines of communication with personnel in the other departments so that maintenance personnel can discuss concerns they may have. Through this informal communications process, the operator can learn about potential hazards in the system. For example, the operator may learn about an event that could have occurred but, because of some intervention, did not. This event would be known to shop personnel but is otherwise difficult or impossible to detect in routine audits. With informal lines of communication open to shop personnel, a CASS may detect this near-event. You should ensure that the operator's CASS procedures address how to encourage this type of communication and interaction.

### **D. Analysis of Audits.**

- 1) Audit results should undergo an analysis to identify a deficiency or a real/potential hazard in any aspect or element of the maintenance program. The objective of the audit analysis is to allow the operator to address the problem in such a way as to avoid recurrence of the deficiencies. To the extent possible, the operator should set forth the analysis process in the CASS documentation.
- 2) The analysis tells operators where to allocate resources and helps them understand what was identified. RM principles should be incorporated into the analysis process. The analysis will help CASS personnel determine the level of priority that the issue merits and what type of additional technical expertise may be required to complete the RCA and evaluate corrective action options.
- 3) The analysis process should be as objective as possible to avoid any tendency to promote individual or commercial interests. The more thorough the analysis, the greater the likelihood the operator will uncover why the system deficiency occurred and how the organization can respond definitively.

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- 4) The analysis process starts during the audit itself, because auditors must collect information for later analysis. If a CASS is to uncover a procedural weakness, for example, information about the procedure must be collected. This should be factual and objective information that does not contain premature judgment about a root cause.
- a) Auditors and analysts should be encouraged to be inquisitive and think in terms of “what if?” so that the CASS functions proactively, detecting problem areas or trends before they can lead to an accident, incident, or infraction of regulations.
  - b) For example, what if event x occurred in conjunction with observed condition y? While audits are designed mainly to verify that an operator is performing maintenance in accordance with its manual, the regulations, and applicable requirements, auditors and analysts should also be alert for systemic deficiencies.
  - c) There may be procedures in the manual that are correctly followed, but that have become outdated, conflict with other manual procedures, or for some other reason are in need of a change. This assessment of the system design should also place priority on finding the systemic or root cause of a program deficiency over seeking to assign personal blame at any level of the organization.
  - d) This inquisitive approach should spread throughout the CASS organization, from determining audit priorities and scheduling through auditing and analyzing, including monitoring and evaluating corrective actions. The end result for this system assessment is seeking out the identification of new or potential hazards.
- 5) The audit analysis process is typically more qualitative than the operational data analysis. Operators may find it useful to manage the collected data through database or quantitative applications. Be aware that this approach does not have to be complicated or costly. The level of formality and sophistication should match the operator’s conditions.

### **4.3.5.19. VERIFY THE CASS FUNCTIONS CONCERNING THE EFFECTIVENESS OF THE MAINTENANCE PROGRAM.**

#### **A. Surveillance of the Effectiveness of the Maintenance Program.**

- 1) The main tool for assessing whether the operator’s maintenance program is effective is the

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collection of operational data (data resulting from airplane operations). This way, the output of the maintenance program can be measured. However, not all operational data or information may be useful for determining maintenance program effectiveness.

**NOTE:** Consistent with the “effectiveness” part of the CASS regulation, the primary type of effectiveness surveillance that the operator should be accomplishing is the collection of operational data.

2) A primary goal of operator CAMP is to ensure that each operator aircraft released to service is airworthy, as well as to provide the maximum level of availability. However, in order to consistently reach these goals, the operator must have a means of determining if the CAMP is producing the intended results.

3) Generally speaking, at the end product level, an indicator of the effectiveness of the maintenance program is the amount of time an operator aircraft is not available for operations due to issues controlled by the maintenance program. This particular effectiveness indicator can be broken down into fleet availability or individual aircraft availability, and broken down still further to the reliability of aircraft systems, subsystems, and components. In simple terms, the amount of unscheduled maintenance that reduces the availability of an operator aircraft for operations is a primary indicator of whether or not the maintenance program is producing its intended results.

### **B. Collecting Operational Data.**

1) Operator operational data collection systems under the CASS effectiveness activity are critical to the operator’s ability to determine the level of effectiveness of its maintenance program. These systems should have capabilities for collecting, storing, managing, and retrieving all types of operational data that the operator can use to help it determine the level of maintenance program effectiveness.

2) Current systems that collect information regarding the status of aircraft structures, systems, and engines have a wide variance ranging from simple paper systems administered manually by operator personnel to the very sophisticated, complex, and automatic real time data collection systems that use information collected from sensors embedded all over the aircraft.

3) In recent years, an increased emphasis has been placed on using these automatic data

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collection capabilities, in conjunction with emerging sensor, data processing, and systems status monitoring and assessment technologies, to realize real-time conditions of aircraft components. While most of these automatic systems are not well defined, the goal is to use real-time flight data to detect system flaws or defects or abnormal operating conditions early enough to allow timely intervention.

4) The key thing to remember is that these new maintenance management systems are part of the continuing evolution of maintenance. They should be characterized as a new and different way of doing maintenance, not a means of eliminating maintenance. As maintenance is still being accomplished, these systems do not eliminate maintenance actions. They may, however, eliminate some scheduled maintenance activities.

### C. Operational Data Procedures.

1) The operator should have written procedures to guide its operational data collection process. CASS procedures should include a risk-based methodology for determining the type and frequency of operational data collection so that resources focus on the most revealing data, with regard to maintenance program effectiveness. An operator CASS should include clear procedures for determining:

- What operational data to collect
- Who will collect it
- How to collect it
- When to collect it
- What to do with it

2) Operational data can be divided into routine or non-routine data collection and analysis. The routine data element uses a proactive data collection and analysis process that seeks to identify indicators of maintenance program ineffectiveness before they can progress to a functional failure that results in a reduction in aircraft availability. Some examples are:

- Aircraft logbook information detailing unscheduled maintenance, including maintenance deferred in accordance with the MEL/Configuration Deviation List (CDL)

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- “Chronic” aircraft systems that have repeat write-ups within a specified time period (e.g., 10 to 15 days)
  - Corrosion prevention and control program findings
  - Engine condition trend monitoring data
  - Individual item failure rates
  - Mechanical Reliability Reports (MRR), Mechanical Interruption Summaries (MIS), and similar data
- 3) The non-routine operational data element is a reactive data collection and analysis process that seeks to identify indicators of maintenance program ineffectiveness after an undesirable event has occurred. Some examples are:
- Accidents and incidents
  - In-flight engine and propeller separations and uncontained engine failures
  - In-flight engine shutdowns
  - High-load events
  - Flight delays and cancellations related to mechanical issues
  - Rejected takeoffs
  - Unscheduled parts replacement or unscheduled maintenance
  - Unscheduled landings due to mechanical issues
  - Lightning strikes
  - Hard landings
- 4) As with reactive audit surveillance, a CASS generally approaches problems from the analytical, systems perspective. For example, in response to one or more rejected takeoffs, a

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CASS might focus the operational data collection and analysis to determine if a pattern in rejected takeoffs was evident, or a CASS might examine other types of data in relation to the rejected takeoff situation.

- 5) The above data sets are presented only as examples. Although the data sets are oriented toward equipment, this area of a CASS may also collect other types of data, such as information on the different types of maintenance errors experienced by the operator.
- 6) The operator's CASS documentation should include a means of identifying data that is relevant and useful for that operator to use in monitoring the effectiveness of its specific maintenance program. The operator should periodically review and reevaluate the usefulness of the data it collects and analyzes to accomplish this portion of the CASS.

### **D. Analysis of Operational Data.**

- 1) Provide analysts with an understanding of the potential significance of each data set and how to process the data to understand its significance. This may require statistical analysis to compare the frequency of certain events or equipment failures with a determined norm, or qualitative analysis to evaluate reports of certain types of events.

**NOTE:** This process is not necessarily the same as what would be used in an GACA-approved reliability program.

- 2) Emphasize that the analysis of operational data should consider root causes of negative trends or anomalies. This preliminary RCA, including human factors, may require collaboration with technical personnel in the affected areas or specialists in engineering and reliability departments, or the OEM.
- 3) Delineate the roles of the CASS analysts as well as other departments or personnel in the analysis of operational data.
- 4) Some operators select a system that uses alerts or warnings if results of the analysis exceed certain predetermined parameters. A CASS should not rely completely on such alerts to the exclusion of analysts' judgment. The GACA's expectation of a CASS in this regard is that the operator has a complete, written procedure to review and analyze the operational data collected, and to determine when further review is necessary.

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5) While the surveillance and analysis steps differ for the verification of the performance of the maintenance program versus verification of the effectiveness of the program, the process merges when responding to CASS findings and providing a corrective action, as necessary.

6) Results from the two requirements of CASS (performance and effectiveness) identify potential deficiencies (hazards) in the maintenance program. In responding to these findings and analyses, the objective of a CASS is to determine the root causes of program deficiencies and address them appropriately, regardless of the perspective from which the deficiencies are found. Note that the discussion is focused on a CASS function, not an organization. For a given operator, that function might be performed by more than one organization.

7) Generally, the area responsible for surveillance will present their results to the technical or production area of the operator with a preliminary analysis of the collected information and, in some cases, possible underlying causes of the problem. Personnel in technical or production areas usually complete the RCA and develop proposed corrective action alternatives.

**4.3.5.21. VERIFY THE CASS FUNCTIONS CONCERNING THE CORRECTIVE ACTION PROCESS.** A corrective action process is the process of interdependent activities that traces the symptom(s) of a problem to its cause, produces solutions in a timely manner for preventing the recurrence of the problem, and implements the changes. The activities within the corrective action process are:

- RCA
- Development of corrective action
- Implementation of corrective action
- Monitoring a corrective action

### A. Root Cause Analysis (RCA).

1) RCA applies to both audit findings and analysis of results and trends in the operational data. For example, either audits or operational data analysis may point to maintenance errors caused by inadequate training. Analysis should not stop with simply determining which mechanics received inadequate training and then retraining the mechanics. Rather, the

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analysis should determine why the training breach occurred and consider areas in management, communications, scheduling, or training program design that may be involved.

- 2) The key is to have a CASS structure that addresses the basic disciplines and elements involved in finding and correcting program deficiencies. The CASS procedures should note that in performing an RCA, all relevant areas should be considered, including the role of senior management in setting appropriate policies, procedures, and an environment of communication.
- 3) Following a systems approach, an RCA treats errors as defects in the system rather than in an individual. RCA looks beyond the symptom to find the organizational defect that permitted an error to occur, to correct the fundamental problem, and to prevent recurrence. The more thorough the analysis, the greater the likelihood that the operator will uncover why the system deficiency occurred and how the organization can respond definitively.
- 4) The process starts during the audit itself, because auditors must collect information conducive to later analysis. If a CASS is to uncover a procedural weakness, for example, information about the procedure must be collected. This should be factual and objective information, not a premature judgment about the root cause. RCA is a key to any complete CASS, even though procedures may vary in complexity from operator to operator.
- 5) Regarding the thoroughness of the analysis, the principles and considerations of an RCA are closely related to those of risk assessment. Both processes do not simply consider the person involved in an issue (for example, the mechanic made a mistake), but all aspects of the organization within which that person works. This approach includes the premise that human error is a consequence of the system rather than a deliberate action of an individual, and that proactive measures and continuous reform of different aspects of the processes and organization can address latent conditions in the system and increase the system's resistance to operational hazards. The term "latent condition" refers to flawed procedures or organizational characteristics that are capable of creating hazards if the right conditions or actions occur.
- 6) Ensure that the operator's procedures or corporate culture do not advocate the blame culture. The blame culture can have a significant negative effect on safe operations. Terminating the individual who has the blame assigned is usually not consistent with an effective RCA.

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a) Operators that adopt the blame culture:

- Fix the blame and move on
- Focus on the individual(s) who made the error
- Stop short of identifying systemic problems and root causes
- Never fix the problem
- Allow mishaps/mistakes to recur

b) Written CASS procedures for an RCA should address the following questions:

- Do documented procedures lay-out when the RCA process will be used?
- What events would trigger the RCA process?
- Do procedures describe who will perform an RCA?
- Are CASS auditors and other CASS personnel trained in RCA?
- Are personnel who are developing a corrective action trained in RCA?
- Do the personnel performing an RCA have a direct knowledge of the process deficiency?
- Are there procedures specific to how an RCA will apply equally to the performance and effectiveness of CASS?
- Does management “support” RCA?
- How does an RCA address findings from outside sources?

### B. Areas of Emphasis for an RCA.

1) Systems analysis plays an important role in a CASS because of the increasing complexity and variety of operations, equipment, and organizations. Systems analysis emphasizes a

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coordinated approach to an enterprise in terms of integrated networks of people and other resources performing activities that accomplish some mission or goal in a prescribed environment.

2) Focusing on a systems approach for identifying why a deficiency occurred, personnel working on the proposed corrective action(s) should ensure that they evaluate the characteristics within the design of a process. This approach recognizes the wide range of interrelated issues that may be associated with a problem in the system, such as management policies, communications, and pilot technique, in addition to the maintenance activities themselves.

3) Human factors analysis looks at how humans communicate and perform in the work environment and then seeks to incorporate that knowledge into the design of equipment, processes, and organizations. This enhances safety and maximizes the human contribution, partly by designing systems to anticipate the inevitability of human error. Human factors that audit checklists can address include basic issues, such as whether there is adequate lighting for mechanics and inspectors to perform their work, and whether schedules permit personnel to get proper rest. But the discipline addresses a wider range of issues affecting how people interface with technology and the operational system, including:

- Human physiology
- How people learn and perceive
- Equipment, technology, and documentation
- Workplace

4) Knowledge gained from human factors analysis can:

- Help avoid maintenance errors
- Ensure that personnel skill sets match task requirements
- Ensure that skill sets are maintained and improved
- Enhance the work environment

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- a) This knowledge can help CASS analysts perform an RCA.
  - b) Continuing with the previous example of inadequate training, with insufficient awareness of human factors issues, operators may trace a maintenance error to a mechanic or technician who appears to have received insufficient training for the task and determine that the solution is more technical training. However, further analysis may reveal that there are contributing flaws in equipment design, job cards, manuals, the work environment, or organizational procedures, such as shift turnover, that more training will not satisfactorily overcome. Or, it may turn out that a different kind of training, perhaps involving decision-making skills, is called for.
- 5) CASS surveillance also should ensure that an RCA considers human factors. Those personnel designated to respond to events such as rejected takeoffs should also include human factors as part of their investigation of individual events. Otherwise, data reviewed in a CASS may be incomplete.
- 6) One challenge presented by the increasing emphasis on human factors is how to balance two seemingly contradictory purposes. On the one hand, the GACA and industry need to encourage personnel to cooperate in addressing system organization and design issues without inhibitions caused by fear of discipline or enforcement. On the other hand, in some cases, individual employees or the operator may bear a degree of culpability (e.g., deliberately bypassing important controls or committing a serious regulatory infraction in the commission of a maintenance error).
- a) In some rare instances, personnel may receive disciplinary action or even GACA enforcement if the action was deliberate and not a result of corporate culture. In any case, a CASS should accomplish an RCA.
  - b) In any event, the specific concern of a CASS is identifying and correcting deficiencies in the maintenance program, not assigning blame to any individual or individuals. A CASS should identify and correct deficiencies in the maintenance program, rather than resolve specific events, even if CASS analysts have the task of researching specific events.

**C. Analytical Tools and Processes.** While it is not a requirement for an operator to implement any specific externally developed system, analytical tools or processes are available to assist in the analysis process. In view of the continuing evolution of this process, as of this writing, some

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examples of these tools are listed below.

- 1) The Maintenance Error Decision Aid (MEDA) tool was developed by the Boeing Human Factors Engineering group in collaboration with the FAA, airlines, and the International Association of Machinists for analyzing human performance issues related to maintenance errors and trends. Operators use MEDA to track events, investigate and prevent maintenance errors, and identify contributing factors, corrective actions, and prevention strategies. A software analysis package has been developed to work with this aid and facilitate analysis of systemic issues.
- 2) The University of Manchester developed the Managing Engineering Safety Health tool in collaboration with British Airways Engineering. The focus of this system is researching the workplace and organizational environment in aircraft maintenance to find the issues with the greatest potential to contribute to human factors problems. The system uses software, diagnostic, and sampling tools. Managing Engineering Safety Health conducts anonymous survey-like assessments among personnel at the work location. This is a more structured, data-intensive approach toward determining and monitoring personnel attitudes toward the system than the interview process discussed earlier. The industry has far less practical experience with Managing Engineering Safety Health than with MEDA.
- 3) The Human Factors Accident Classification System Maintenance Extension tool was developed by the U.S. Naval Safety Center in collaboration with the FAA for use in the operator industry as well as naval aviation. This comprehensive system incorporates a number of analytical tools and has profiled maintenance errors and contributing conditions, permitting development of potential prevention measures. While the Human Factors Accident Classification System Maintenance Extension may be more sophisticated than many operators would need, it demonstrates principles and techniques of software-aided analysis that operators could apply to a CASS.

### **D. Developing and Implementing a Corrective Action Plan (CAP).**

- 1) *Development.* After the assessment of risk and completion of an RCA, a final decision can be made on a proposed CAP. As directed by written procedures, the CAP should address the root cause of the deficiency and provide a means of verifying that the corrective action fixed the problem.

- a) Responsibility/Authority.

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1. A CASS should designate the position or organization responsible for evaluating and approving proposed corrective actions as well as the parties responsible for implementing, monitoring, and ensuring that all affected parties receive notification, both within the company and externally, if necessary.
2. The CASS director or other designated manager may appoint a corrective action team to design and propose a corrective action. The team, which typically represents a cross section of the departments involved in audits, operational data collection, analysis, and production, oversees the implementation of the corrective action.
3. Technical and reliability control boards are most often used in conjunction with GACA-approved reliability programs; however, a similar concept applies to a CASS, even if no GACA-approved reliability program exists.
4. The danger exists that one individual might be assigned to develop an entire CAP for which they have relatively little or no control (authority) to implement, and is a discrepancy in itself and must be fully addressed before any corrective action is assigned. Ultimately, the direct responsibility must always remain with the department required to address the discrepancy.
5. For example, a corrective action may require a revision to a manual. The department (inspection) that is responsible for the CAP might require the assistance of another department (technical publications) to publish the revision. Consequently, the department that is able to publish the manual would now be responsible (secondary) for publishing the manual.
6. It would be acceptable for auditors to help guide the responsible persons through the corrective action process. However, the auditors must remain independent from the corrective actions they may subsequently audit. The roles of auditors, analysts, managers, and committeees should be clear when implementing the CAP.
7. The appropriate authority must accompany the responsibility if the process is to be effective. CASS procedures should address:

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- Who has received the authority to develop the CAP?
- Who will be responsible to develop the CAP?
- Who is responsible to approve the CAP?
- Does the operator maintain the appropriate role of auditors in developing a CAP?

### b) Duties.

1. The CASS procedures should identify how this plan will receive approval and at what level of the company. The CAP should address all relevant issues, including a timetable for completion of the action with milestones, if appropriate. The appropriate technical department (and other departments, such as flight operations, if the corrective action goes beyond the inspection and maintenance organizations) should then implement the plan.
2. While developing a corrective action, consideration should be made for determining the effectiveness of the corrective action. The corrective action should address what exactly would determine the effectiveness of the corrective action during the follow-up process. Being that the corrective action is developed to address the causal factor(s), the determination of the effectiveness should be based on what measure(s) would be used to validate the effectiveness.
3. For example, if the deficiency involved the installation of incorrect fasteners and the root cause was determined to be the lack of training, the future follow-up would evaluate the effectiveness of any training that might have been implemented as it relates to the deficiency. Are the incorrect fasteners being installed after training has been accomplished?

- c) CASS procedures should specify that personnel will analyze a corrective action proposal carefully before its selection and implementation to ensure that corrective action is necessary and will actually fix the problem and not lead to unintended negative consequences.

1. Operator procedures should instruct both the CASS and technical area

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personnel of the need to consider the impact of the proposed corrective action on other aspects of the operation. This includes other areas of the maintenance program, such as manuals. The corrective action may require coordination with other areas, such as flight operations, that might be affected.

2. A CASS should provide written procedures for the development of a CAP that addresses:

- When a CAP will be developed, based on risk assessment
- How to develop a corrective action proposal with the focus being on addressing the root cause, as necessary
- Documentation of timelines for accomplishment of tasks within the CAP
- How will the plan be approved
- The recordkeeping and documentation requirements of the CAP
- How risk assessment and/or systems analysis will be used to guard against unintended consequences
- How the effectiveness will be determined during the follow-up process (as necessary)

3. In some cases, the operator may require data or assistance from a manufacturer to help correct a deficiency detected by the CASS. The operator should offer guidance in its CASS procedures, based on its particular experience, on how CASS and other personnel should address the need for assistance or information from manufacturers, and how to proceed in case of unsatisfactory or slow responses.

2) Implement the CAP. After development of a CAP, the responsible individual(s) must implement the plan. The importance of actually implementing the plan cannot be overstated. The completion of the corrective action must occur so that the discrepancy is addressed and the necessary follow-up surveillance can occur so that the effectiveness of the corrective action can be determined.

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### a) Responsibility/Authority.

1. The danger exists that one individual might be assigned to implement an entire CAP for which they have relatively little or no control (authority) to implement, and is a discrepancy in itself and must be fully addressed before any corrective action is assigned. Ultimately, the direct responsibility must always remain with the department that is required to address the discrepancy.
2. For example, a corrective action may require a revision to a manual. The department (inspection) that is responsible for the CAP might require assistance from another department (technical publications) to publish the revision. Consequently, the department that is able to publish the manual would now be responsible (secondary) for publishing the manual.
3. In the event that a CAP requires changes, procedures should assign authority to specific individuals to enable them to make changes to the plan.
4. It would be acceptable for auditors to help guide the responsible persons through the corrective action process. However, the auditors must remain independent from the corrective actions that they may subsequently audit.
5. The roles of auditors, analysts, managers, and committees should be clearly defined when implementing the CAP.
6. The appropriate authority must accompany the responsibility if the process is to be effective. CASS procedures should address the following questions:
  - Who will be responsible for implementing the CAP?
  - Who is responsible for making changes to the CAP?
  - Who will determine when the CAP has been completed?
  - Does the operator maintain the appropriate role of auditor when implementing a CAP?

### b) Duties. Accomplishment of these duties is essential to the success of a CAP.

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1. CASS procedures should ensure that the corrective action is implemented. Procedures should specify how to implement the plan from the time of development to closure.
2. The CAP should be specific as to what is expected to occur or to be accomplished. Clear timelines should document the completion of specific actions within the plan. For example, a CAP might have numerous actions that must occur in order to complete the plan, perhaps in a sequential order.
3. It is essential that communication exists throughout the corrective action process. Procedures should include guidelines for how the technical area will communicate the status of the corrective action to the person responsible for monitoring implementation. Also, procedures should provide all parties involved with what will constitute a closure of individual action items within the plan and/or the plan in whole.
4. The procedures for auditors, analysts, managers, and committees should be clearly established if the process is to be effective. CASS procedures should address the following questions:
  - How will the implementation of a CAP be accomplished?
  - How will changes to the documented plan and/or timeline be addressed?
  - When will individual action items within the CAP and/or entire CAP be considered “closed”?

### 3) Monitoring the CAP.

- a) Under the CASS, monitoring of the CAP should be a documented and systematic approach towards ensuring the implementation of the documented CAP. Without documented procedures for monitoring the CAP, the possibility exists that corrective action will not be implemented.
- b) Furthermore, if a corrective action was developed to mitigate or eliminate causal factors and was not implemented, the effectiveness of the corrective action could not be measured and the causal factors would still exist. CASS procedures should ensure that

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the corrective action was completed.

c) Responsibility/Authority.

1. An identifiable individual or entity (such as a CASS board) should be given the overall responsibility and authority for monitoring the status of the CAP. CASS auditors or analysts may have the direct responsibility of ensuring that the corrective action has been completely implemented in accordance with the established timetable or, if not, determining why the timetable has changed.
2. Responsibilities should include determining if any changes in the corrective action are acceptable, as well as who will make the determination for plan closure.
3. The roles of auditors, analysts, managers, and committees should be clear when monitoring the CAP. The appropriate authority must accompany the responsibility if the process is to be effective.
4. CASS procedures should address:

- Who will monitor the status of the CAP?
- Who will approve changes to the CAP?
- Who will determine when the CAP has been completed?

d) Duties. The following procedures are essential to the success of the corrective action:

1. CASS procedures should ensure that the corrective action was completed. Therefore, procedures should specify how the plan will be monitored from the time of implementation to closure.
2. The means for tracking the corrective action against a timeline will vary between operators, and methods are normally dependent on the policies of the operator. Monitoring the plan may be accomplished through the use of electronic media and/or paper media. Procedures should identify what method or methods will be used to monitor the implementation of the CAP.

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3. Effective communication must exist between the owner of a CAP and the individual who is monitoring the plan. Procedures should include clear guidelines for communicating the status of the corrective action from the affected technical area to the individual responsible for monitoring implementation. Also, procedures should provide all parties involved with a clear performance standard for closure of individual action items within the plan and/or the plan as a whole.
4. Auditors, analysts, managers, and committees must have clearly-established procedures if the monitoring process is to be effective. CASS procedures should address the following questions:
  - How will the CAP be tracked (monitored) in accordance with the timeline?
  - How will automation or computerized systems be used to monitor the implementation?
  - How will changes to the documented plan and/or timeline be addressed?
  - When will individual action items within the CAP and/or entire CAP be considered “closed”?

### **E. Verify the CASS Functions Concerning the Follow-up Process.**

- 1) At the beginning of the corrective action process, a risk-based determination was made to mitigate or eliminate the associated risk. This determination led to the development and implementation of a CAP (risk control).
- 2) When a CAP included an RCA, the primary goal of the CAP would have been to prevent recurrence of the discrepancy. To be effective, the plan would have specifically addressed the identified causal factor(s).
- 3) Additional surveillance or data collection may be necessary to validate the effectiveness of the CAP. The follow-up surveillance plan is the means by which the effectiveness is validated and has two principles: verifying the effectiveness of the CAP and additional surveillance planning (auditing and/or data collection).
  - a) Responsibility/Authority.

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1. An identifiable individual or entity (such as a quality organization) should be given the responsibility and authority for performing the follow-up of the CAP. CASS auditors or analysts may have the responsibility for making a determination of the effectiveness of the CAP and may sometimes determine that the corrective action was not effective and requires additional action(s).

2. The roles of auditors, analysts, managers, and committees should be clearly defined in the CAP process as well as the additional surveillance planning process. The appropriate authority must always accompany the responsibility if the process is to be effective.

3. CASS procedures should address the following questions:

- Who will validate that the CAP was effective?
- Who will approve changes to the surveillance planning or immediate actions?

b) Duties.

1. Performance measures to evaluate the effectiveness of the corrective action should be specific. The performance measures should have been established during the development of the CAP, and should provide the information necessary to determine the level of action plan effectiveness.

2. Verifying the CAP effectiveness may require a one-time audit or could require a series of frequent audits. CASS procedures should include how to determine the level of follow-up audits for verifying corrective action implementation. For example, based on the risk assessment or complexity of the corrective action, the designated CASS analyst or team may schedule special, less frequent, or more frequent audits.

3. They may also change the data collection process or institute other means of verification. The GACA expects the operator to have a well-designed and logical process to design the follow-up actions.

4. The accomplishment of the follow-up process should be verifiable. The operator

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should document the outcome of the process. This documentation should provide enough information to be able to conclude that the process has been accomplished.

5. The procedures for auditors, analysts, managers, and committees should be clear if the process is to be effective. The methodology will probably vary from one operator to another, but the principles should be evident and verifiable in written procedures.

6. CASS procedures should address:

- What measures will be used to evaluate the effectiveness of the corrective action, including identification of data to be collected, awareness of the possibility of unintended consequences, and events that should trigger a response
- When and/or how often the follow-up will occur
- How to use the automation or computerized systems to document the follow-up process
- How to determine changes to surveillance planning and/or data collection

**F. Analyze Results.** Upon completion of the review/surveillance, analyze the results and determine if the operator's CASS meets all of the requirements. If there are deficiencies, initiate collaborative discussions with the operator to resolve the issues.

### 4.3.5.23. TASK OUTCOMES.

**A. Complete the GAR.**

**B. Complete the Task.** Successful completion of this task will result in the acceptance of the CASS program or revision and/or a determination that the CASS is being performed properly and is producing the desired results.

**C. Document the Task.** File all supporting paperwork in the operator's GACA office file.

### 4.3.5.25. FUTURE ACTIVITIES.

Normal surveillance.

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#### **CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125**

##### **Section 6. Evaluate/Inspect Operators Actions to Include Supplemental Structural Inspections into the CAMP**

###### **4.3.6.1. GACA ACTIVITY REPORT (GAR).**

A. 3634 (AW) (Aircraft Records)

B. 3647 (AW) (Spot Inspection)

**4.3.6.3. OBJECTIVE.** General Authority of Civil Aviation Regulation (GACAR) § 121.469 requires affected operators to incorporate into their Continuous Airworthiness Maintenance Programs (CAMP) a GACA-approved-damage-tolerance based inspections and procedures for aircraft structure susceptible to fatigue cracking that could contribute to a catastrophic failure (NOTE: For the purpose of this section, this structure is termed “fatigue critical structure (FCS)). This includes existing and new repairs, existing and new alterations/modifications, and repairs to alterations that affect FCS. The adverse effects of the repairs and alterations must be addressed by the application of a damage tolerance evaluation (DTE). The operator’s methods to incorporate Damage Tolerance Inspections (DTI) data into their CAMP is subject to approval by the operator’s principal maintenance inspector (PMI). The General Authority of Civil Aviation (GACA)-approved “means” include lists of FCS, DTI for existing/future repairs and alterations that affect FCS, and a process for assessing existing repairs (e.g., Repair Evaluation Guidelines (REG)). DTI are the inspections developed as a result of a DTE. The DTI includes the areas to be inspected; the inspection method; the inspection procedures, including acceptance and rejection criteria; the threshold; and any repeat intervals associated with those inspections. The DTI may specify a time limit when a repair or alteration needs to be replaced or modified. If the DTE concludes that DT-based supplemental structural inspections are not necessary, the DTI contains a statement to that effect.

###### **4.3.6.5. GENERAL.**

**A. Compliance Documents.** The compliance document developed by a design approval holder (DAH) provides the basic guidance (including identification of the FCSs), DT data, and

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implementation schedule information. It is the means by which a operator may incorporate DTI and procedures. The integration of the compliance document processes, data, and requirements into the operator's existing maintenance program may be accomplished in a way that best fits the operator's programs. The General Authority of Civil Aviation (GACA) recommends that operators develop an Operator Implementation Plan (OIP) using the guidance contained in Federal Aviation Administration (FAA) Advisory Circular (AC) 120 93 (as amended), Damage Tolerance Inspections for Repairs and Alterations. The PMI can then approve the OIP for each airplane model affected.

**B. Procedures.** For each affected airplane model in an operator's fleet, the operator should review the applicable GACA-approved compliance documents. The compliance document will identify all FCSs, the DT data for the FCSs, and implementation schedule information for incorporating DT data into the operator's maintenance program. (See Figure 4.3.6.2, Sample Operators Implementation Plan.)

**NOTE:** For purposes of this section, the oversight office of the FAA in the United States (US) is the FAA aircraft certification office of the FAA Transport Aircraft Directorate with oversight responsibility for the relevant type certificate or supplemental type certificate. For Saudi Arabian registered aircraft, it is GACA policy to accept the approvals made by the FAA oversight office.

- 1) The operator should review any additional GACA-approved compliance documents associated with a given model aircraft for repairs and repairs to alterations or modifications and third party approved repairs. These may be applicable to the entire model fleet or to individual aircraft within a given fleet type. These compliance documents will also identify all FCSs for that fleet type, the DT data for the FCSs, and implementation schedule information for incorporating DT data into the operator's maintenance program.
- 2) Figure 4.3.6.1, Operator Implementation Plan Approval Process shows how an operator can develop an OIP for airplanes in its fleet using the compliance document. The OIP is operator specific and incorporates processes and procedures that may include administrative procedures for applying elements contained in the DAH compliance documents. Operators should consider the guidance in the following flowchart when developing an OIP.

**4.3.6.7. INCORPORATION OF DT DATA FOR NEW AND EXISTING REPAIRS.** After the reviews of the applicable compliance document are complete, the operator should include the

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following in an OIP:

**A. New Repairs.** A process to ensure that the operator will evaluate all new repairs to an FCS for DT and implement DTI or other procedures, if necessary.

**B. Existing Repairs.** A process to ensure that the operator evaluates all existing repairs to an FCS for DT and that he or she implements DTI or other procedures. This process would include:

- 1) A process to determine if DT data for an FCS have been incorporated throughout the life of the airplane. If so, no further action is required for existing repairs.
- 2) A process to survey existing repairs to an FCS and determine DTI for those repairs. Derive these processes from the compliance document applicable to those airplanes. Incorporate them into the maintenance program within the timeframe given in the compliance document.

**C. Schedule.** An implementation schedule following guidance provided in the compliance documents.

**D. Implementation Techniques.** Use one of the two techniques below to implement DTI for repairs:

- 1) The first technique involves incorporation of DT data directly into the operator's maintenance program.
- 2) The second technique involves an alternative to tracking individual repairs. In this approach, incorporate the DTI as part of an operator's routine maintenance program. This approach is well suited for operators of large fleets and would entail evaluating repairs at predetermined, planned maintenance visits as part of the maintenance program. This technique would require the operator to choose an inspection method and interval using a GACA-approved DTE. Use the regular CAMP for repairs where the inspection requirements use the existing inspection methods and intervals. Repairs added between the predetermined maintenance visits should have a threshold greater than the predetermined maintenance visit. The operator may also individually track it to account for the unique inspection method used and the interval requirements of the repair. This would ensure the airworthiness of the structure until the next predetermined maintenance visit, when the operator would evaluate the repair as part of the repair maintenance program.

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3) The operator cannot exceed DTI thresholds and repeat intervals for individual repairs without GACA approval. Once it incorporates DTI thresholds and repeat intervals into its maintenance program, it cannot escalate the DTI intervals without specific approval from the GACA.

**4.3.6.9. REPAIRS, ALTERATIONS, AND REPAIRS TO ALTERATIONS.** The following is an overview of the operator's tasks that are further developed in FAA AC 120-93 (as amended), Damage Tolerance Inspections for Repairs and Alterations.

**A. Review the Applicable Compliance Documents.** These documents are developed by the type certificate holder (TCH) and STC holder and are approved by the FAA Oversight Office or GACA. Upon approval, the TCH and STC holder are required to make the compliance documents available to operators.

**B. Additional Data.** Obtain or develop additional DT data for alterations not addressed by the applicable compliance document.

1) Identify alterations that exist in the operator's fleet that affect the Fatigue Critical Baseline Structure (FCBS).

2) Identify and contact the TCH or STC holder for the applicable alteration and request the DT data for that alteration. If the TCH or STC holder no longer exists or is unable to make the data available, it becomes the responsibility of the operator to develop or obtain the DT data using the guidance contained in FAA AC 120-93, Chapter 4, Operator Tasks for Repairs and Alterations. For alterations not developed by a TCH or STC holder, it is the responsibility of the operator to obtain the necessary DT data for that alteration.

**C. Required Information.** The OIP should contain the information described in FAA AC 120-93, paragraph 402, Contents of an OIP. The information in the OIP should provide the basis and means for operator compliance with GACAR § 121.469. It will be necessary for the operator to coordinate development of the OIP with its PMI.

**D. Incorporate the REG in the OIP to Include:**

1) A process to conduct airplane surveys to enable identification of repairs that affect an FCBS.

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2) A process to determine how to obtain DTI for those repairs that affect the FCBSs that the operator identifies in the survey.

3) A process to determine schedules of airplane surveys and incorporating necessary DTI into an operator's maintenance program.

### **E. Submit the OIP to the PMI for Approval.**

### **F. Incorporate the OIP into the Maintenance Program.**

**G. Reporting Requirements.** GACA encourages operators to report significant findings to the TCHs to ensure that prompt fleet action is taken. Existing reporting requirements under GACAR §§ 121.1549 and 121.1553 still apply.

**H. Recordkeeping Requirements.** Once the operator receives approval for the implementation plan, existing Part 121 recordkeeping requirements are still applicable, as defined in GACAR § 121.699.

**I. Amendment 25-45 Certifications.** For particular airplane models certified to FAR/GACAR Part 25, Amendment 25-45 or later, the TCH or STC holder may not need to develop additional DT data. For such cases where additional DT data is not necessary, the TCH or STC holder will still need to substantiate this conclusion for the FAA Oversight Office or GACA and develop a compliance document. The airplane model-specific compliance document would include a statement that operators do not need additional DT data from the TCH or STC holder to support compliance with the GACAR. In these cases, the information provided in the TCH's or STC holder's compliance document will support an operator's demonstration to its PMI that its existing maintenance program meets the intent of the GACAR, relative to alterations that affect an FCBS.

**J. Transfer of Airplanes.** Before adding an airplane to an operator's OpSpecs, the following should apply:

1) For airplanes previously operated under a CAMP, the new operator should continue implementation of the previous PMI-approved OIP. The operator may use either the previous operator's schedule or the new operator's schedule, whichever would result in an earlier accomplishment date for the repair evaluation.

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2) For airplanes not previously operated under a CAMP, the operator develops and implements an OIP. If the operator exceeds the airplane's design service goal (DSG) and compliance times, accomplish any outstanding DTI according to a schedule approved by the PMI.

**K. Operation of Leased Foreign-Owned Airplanes.** Acquisition of a dry leased, foreign-owned airplane for use in operations under GACAR Part 121 will require the operator to develop and implement an OIP.

**4.3.6.11. MAINTENANCE PROGRAM CHANGES.** When revising a maintenance program containing DTI for repairs and alterations affecting an FCBS, the operator should evaluate any impact of the change on the DTI. This evaluation should be made in accordance with the operator's CASS and GACA-approved repair evaluation guidelines (REG). If the evaluation shows that a DTI needs to be revised, the operator must submit any revision to a DTI through the PMI to the GACA Airworthiness Engineering Section for review and approval.

**NOTE:** After initial approval of the OIP, the only time that re-approval is required is if changes are made to the processes for obtaining DT data for existing or new repairs and alterations/modifications. New or revised DTI are a product of these processes and do not require separate approvals via the OpSpec.

**4.3.6.13. GACA PMI APPROVAL OF OPERATOR'S IMPLEMENTATION PLAN.** The operator's PMI is responsible for approving the means for incorporation of the DT data for repairs into an operator's CAMP. An OpSpec revision will show approval of the plan.

**4.3.6.15. PREREQUISITES AND COORDINATION REQUIREMENTS.** Prerequisite knowledge of the regulatory requirements of GACAR Part 121. Consult with the GACA Airworthiness engineers.

### **4.3.6.17. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- FAA AC 120-93(as amended), Damage Tolerance Inspections for Repairs and Alterations
- Operator's maintenance manuals

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**B. Forms.** GAR.

**C. Job Aids.** None.

**D. Complete the GAR Record.**

**E. Complete the Task.** Successful completion of this task will result in the following:

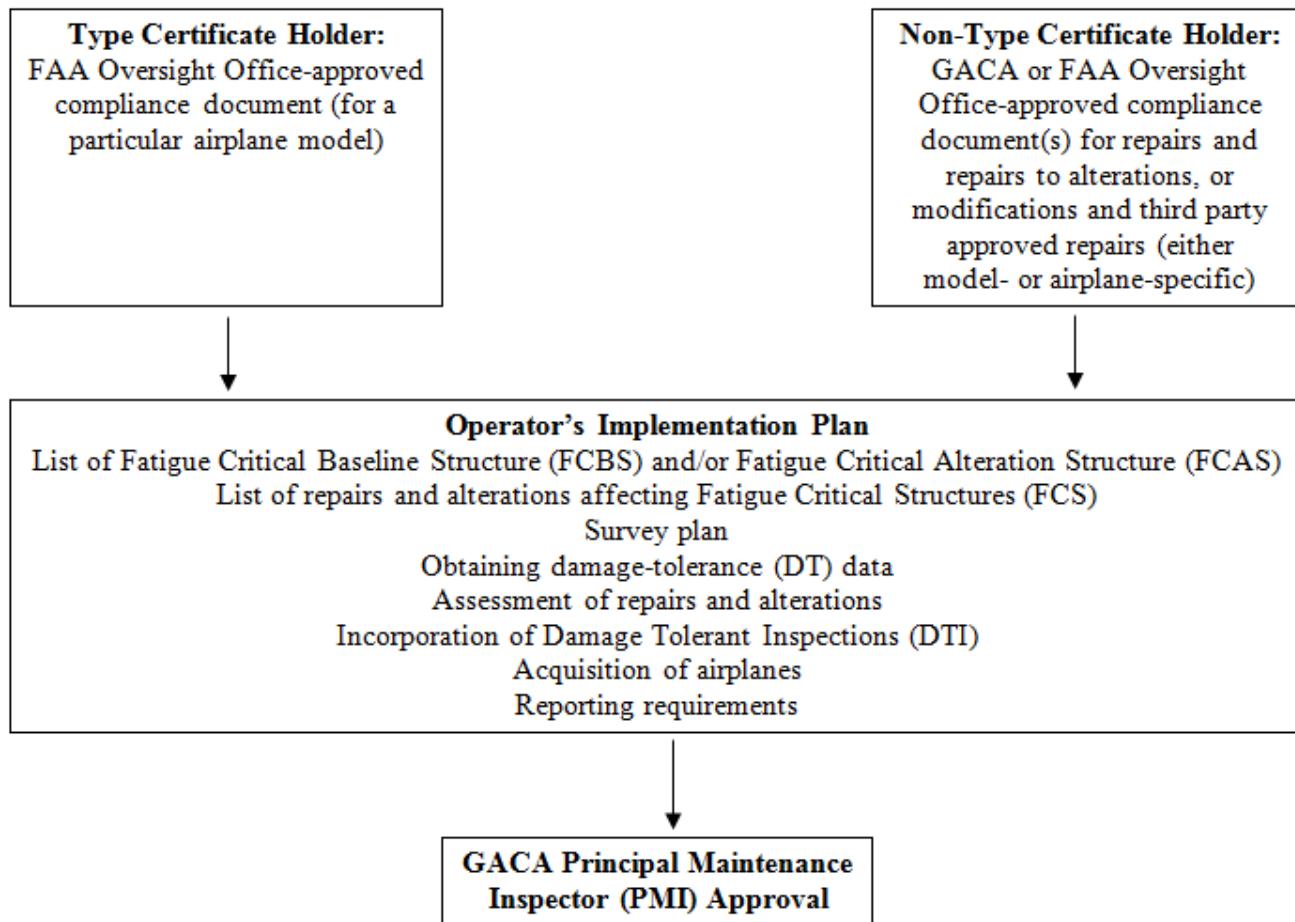
- 1) An approved OIP.
- 2) Revision of the operator's manual system to include the OIP.
- 3) Issuance of OpSpec D97.

**4.3.6.19. TASK OUTCOMES.** If not already accomplished, document that the operator has successfully incorporated the GACA-approved DT-based inspections and procedures for airplane baseline structure into its maintenance program by approving the incorporation of OpSpec D97.

**4.3.6.21. FUTURE ACTIVITIES.** Ensure that operators continue to comply with GACA-approved DT-based inspections and procedures for airplane baseline structure through a surveillance program.

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**Figure 4.3.6.1. Operator Implementation Plan Approval Process**



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**Figure 4.3.6.2. Sample Operators Implementation Plan**



# Savino Airlines



## **1. Operator Implementation Plan (OIP).**

To meet the requirements of General Authority of Civil Aviation Regulation (GACAR) Part 121, § 121.469, Savino Airlines will implement the following processes to ensure that it obtains and applies damage-tolerance (DT) data. Savino Airlines developed the procedures detailed in this OIP in accordance with the guidance contained in FAA Advisory Circular (AC) 120-93, Damage Tolerance Inspections for Repairs and Alterations. Where processes already exist within the Maintenance Manual (MM) that complies with FAA AC 120-93, this OIP will reference the pertinent portions of the MM containing the process. Savino Airlines will incorporate new processes developed in this OIP into the respective areas of the MM.

## **2. Fatigue Critical Structure (FCS).**

Savino Airlines will obtain the list of Fatigue Critical Baseline Structure (FCBS) from type-operators (TCH) of airplanes in our fleet. Savino Airlines will also obtain a list of Fatigue Critical Alteration Structure (FCAS) from the design approval holder (DAH) of alterations affecting or containing FCS on airplanes in our fleet. Savino Airlines will incorporate these lists into the MM, chapter 6, Repairs and Alterations. Procedures within this chapter will state that any repairs to FCS accomplished in the future will have a damage-tolerance analysis (DTA) performed and Damage Tolerant Inspections (DTI) developed, if necessary. The procedure will require that the GACA approve the DTA and any DTI. Repairs or alterations will use repair authorization form SA-BR549 to accomplish and record the repair or alteration.

## **3. List of Repairs and Alterations Affecting FCS.**

If Savino Airlines has removed alterations from an airplane but altered structure remains, it

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will include these alterations in the list of alterations. Savino Airlines will list, in the major repair report for the individual airplanes, repairs identified during the survey that affect FCS. This list will be made available to the GACA upon request. Savino Airlines will use form SA-BR549-R for compiling the list of repairs identified in the surveys. Savino Airlines will develop this list using the list of FCBS and FCAS provided by the DAHs.

### **4. Obtaining DTI for New Repairs and Alterations.**

#### **A. Process to obtain DTI for new repairs:**

- 1) Savino Airlines will not install any future repairs to FCBS or FCAS that is not DT.
- 2) Savino Airlines will obtain the DTI for new repairs by following one of the three following methods:
  - a) Using Original Equipment Manufacturer (OEM) DT data previously approved such as Structural Repair Manual (SRM) or service information.
  - b) Using third party developed GACA-approved DT data for a particular repair.
  - c) Savino Airlines may obtain DT data using the three-step process contained in FAA AC 120-93, appendix 5, and it will track individual repairs using the TRAX system (see MM, chapter 4) to assure that it does not exceed the 12-month limitation for individual repairs.

**B.** Savino Airlines will obtain from the DAH any DTI for new alterations that affect FCBS, and will incorporate such DTI into the regularly scheduled maintenance program. If DTI are not applicable to a new alteration, Savino Airlines will obtain a statement to that effect and place it in the aircraft records. (See MM, chapter 4.)

### **5. Assessment of Existing Repairs and Alterations.**

Savino Airlines will use the Repair Evaluation Guidelines (REG) developed by the individual OEMs (appendix A) to assess currently installed repairs and alterations on the following schedule.

#### **A. Savino Airlines will survey DC-10 Airplanes using JPC 120.93-DC-10 per the**

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following schedule:

- 1) HZ415-435 before the airplane reaches 37,500 cycles.
- 2) HZ436-440 at the next “D” check or before December 2016 or 50,000 cycles, whichever is later.
- 3) HZ441-449 at the next “D” check or before December 2016.

**B.** Savino Airlines will survey B-757 Airplanes using JPC 120.93 B-757 per the following schedule:

- 1) HZ342-350 before the airplane reaches 37,500 cycles.
- 2) HZ351-360 at the next “D” check or before December 2016 or 50,000 cycles, whichever is later.

**C.** Savino Airlines will survey A-330 Airplanes using JPC 120.93-A-330 prior to reaching 24750 cycles or 75000 flight-hours.

### **6. Obtaining DTI for Repairs and Alterations.**

**A.** Savino Airlines will review aircraft records and its maintenance schedule to determine if DTI exist for those repairs and alterations installed on Savino Airlines’ fleet. Savino Airlines will perform surveys to identify repairs and alterations that it did not identify through record reviews.

**B.** Savino Airlines will use the following information for obtaining DT data for repairs and alterations identified during the surveys that do not have DTI:

- 1) Using OEM DT data previously approved such as SRM or service information.
- 2) Using third party developed GACA-approved DT data for a particular repair.
- 3) Savino Airlines will obtain DT data using the three step process contained in FAA AC 120-93, appendix 5, and it will track individual repairs using the TRAX system (see MM, chapter 4) to assure that it does not exceed the 12-month limitation for

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individual repairs.

- 4) If DAH DT data and DTI are not available, Savino Airlines will contract with GACA-approved DERs to develop the needed DTI. (See MM, chapter 6.)

### **7. Incorporation of DTI.**

**A.** Savino Airlines will incorporate required DTI for repairs and alterations that have been made available by DAHs into its maintenance schedule per the maintenance revision process contained in MM, chapter 6. Savino Airlines will specifically identify each required DTI within the maintenance schedule. Aircraft Records will control the last accomplished and next due dates through the TRAX system. (See GM, chapter 4.) Incorporation of these DTI will be in accordance with the following schedule:

- 5) If the DTI for a repair specifies a threshold of less than the next “C” check due date, Savino Airlines will accomplish inspection of the repair at the “C” check, or
- 6) If the threshold for the inspection is later than the next “C” check due date, Savino Airlines will inspect the repair at that threshold or earlier.
- 7) Savino Airlines will accomplish repetitive inspections at the time limits specified in the DTI.

**B.** Savino Airlines will incorporate the required DTI for alterations for which DTI has not been made available into its maintenance schedule per the maintenance program revision process contained in the MM, chapter 5. As for repairs, Savino Airlines will specifically identify alterations within the maintenance schedule. Aircraft Records will control, through the TRAX system, the last accomplished and next due dates. (See MM, chapter 4.) Incorporation of these DTI will be in accordance with the following schedule:

- 1) Alterations identified during the records reviews or alterations developed by persons other than TCHs or Supplemental Type Certificate (STC) holders for Savino Airlines’ airplanes will submit DT data developed for these alterations to the GACA no later than December 20, 2012, for airplanes that have exceeded 75 percent design service goal (DSG). Savino Airlines will incorporate the DTI no later than 6 months from the date of GACA approval.

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- a) DC-10, 37,500.
- b) B-757, 37,500.
- c) A-330, 24750 cycles or 75,000 flight hours.

- 2) Alterations identified during the survey that do not have DT data developed will use the process in MM, chapter 6 for performing a DTE on these alterations within 12 months of discovery during the survey. Savino Airlines will submit the DT data developed from the DTE to the GACA through the PMI. Savino Airlines will incorporate the DTI developed into the maintenance program per the MM, chapter 5, within 6 months of the date of GACA approval.
- 3) Savino Airlines may use DT data developed for an alteration that is applicable to more than one airplane in a specific fleet for all of those airplanes without further evaluations and approval.

C. Savino Airlines will enter into the Maintenance Tracking System each airplane and its survey due date. As Savino Airlines surveys its airplanes, it will update TRAX to show completion and times required for obtaining DTI and any DTI that it must track separately from normal maintenance requirements. Aircraft Records will submit a report to the chief inspector of airplane survey due dates and completion dates. Aircraft Records will also notify the chief inspector of any airplanes that have not been surveyed but are within 60 days of the survey due date. The chief inspector will notify maintenance scheduling to schedule the airplane for its survey within 30 days. For repairs and alterations that require obtaining DTI, Aircraft Records will track each repair and alteration and notify the chief inspector 60 days prior to the due date for obtaining the DTI. The chief inspector will assure that DTI are obtained prior to the due date. If the DTI cannot be obtained, the chief inspector will remove the affected airplane from service until the DTI is obtained and incorporated into the maintenance schedule.

### **8. Acquisition Airplanes.**

Airplanes added to Savino Airlines' operations specifications (OpSpecs) that have been operated previously by a GACAR Part 121 operator will bridge the previous operators OIP into Savino Airlines' OIP in accordance with Savino Airlines' bridging document, chapter 2. Airplanes that have not previously been operated under an approved GACAR Part 121 program

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will receive a complete survey for repairs and alterations in accordance with this OIP prior to being placed into service. Savino Airlines will not lease or operate any airplanes of foreign registry.

### **9. Reporting and Recordkeeping Requirements.**

Savino Airlines will report, per § 121.1553, damage to FCBS and FCAS, in accordance with procedures in MM, chapter 3. Savino Airlines will retain records of all repairs and alterations identified as affecting FCBS and FCAS in accordance with MM, chapter 4.

### **10. Program Approval and Program Revisions.**

Savino Airlines will submit this OIP and future proposed revisions to the PMI for review and approval. The PMI will indicate approval of this OIP and accompanying revisions to the MM to incorporate the OIP processes by issuing OpSpecs D97. Savino Airlines will submit to the PMI for acceptance any revisions to manuals listed in the MM, chapter 1, that this OIP affects, prior to December 20, 2012. Savino Airlines must submit revisions to the OIP to the PMI for approval. Upon approval, OpSpec D97 will be revised to reflect the revision by date. Savino Airlines will substantiate revisions to the maintenance program that incorporated new or revised DTI using data developed under its CASS per MM, chapter 10.

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### CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125

#### Section 7. Evaluate/Inspect Part 121 Operator's Electrical Wiring Interconnection Systems Maintenance Program

##### 4.3.7.1. GACA ACTIVITY REPORT (GAR).

A. 4319 (AW) (Initial)

B. 4320 (AW) (Revision)

**4.3.7.3. OBJECTIVE.** This section provides specific guidance for principal maintenance inspectors (PMIs) charged with determining an operator's compliance with inspections and procedures for Electrical Wiring Interconnection Systems (EWIS) based on EWIS, Instructions for Continued Airworthiness (ICA) developed under the provisions of Appendix H to General Authority of Civil Aviation Regulation (GACAR) Part 25 applicable to each affected aircraft (including those ICA developed for supplemental type certificates installed on each aircraft).

**NOTE:** For aircraft subject to GACAR § 26.11, the EWIS ICA must comply with GACAR Part 25, Appendix H, paragraph H25.5(a)(1) and (b).

**NOTE:** For aircraft subject to GACAR § 25.1729, the EWIS ICA must comply with GACAR Part 25, Appendix H, paragraph H25.4 and all of paragraph H25.5.

**NOTE:** This section addresses only EWIS requirements and provides guidance accordingly. Guidance for operator compliance with fuel tank safety (FTS) regulations is contained in Section 3 of this Chapter.

**4.3.7.5. GENERAL.** This EWIS ICA consists of inspection and restoration tasks, task intervals, procedures to accomplish these tasks, and "protection and caution" instructions/information for the EWIS. The design approval holder (DAH) develops these ICA. AC 25-27 (as amended), Development of Transport Category Airplane Electrical Wiring Interconnection Systems Instructions for Continued Airworthiness Using and Enhanced Zonal Analysis Procedure, is a means of compliance for DAHs to develop EWIS ICA. For the purposes of this chapter, TC and STC holders are referred to as "DAH"

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when used in context.

**4.3.7.7. COORDINATION REQUIREMENTS.** This task requires coordination between the aviation safety inspector (Inspector) (Airworthiness) and the operator. It may also include coordination with the Airworthiness Engineering Section for initial/revision approval of EWIS ICA and GACAR Part 145 repair stations.

### 4.3.7.9. APPLICABILITY.

**A. Affected Aircraft.** GACAR § 121.473 applies to operators of transport category, turbine-powered airplanes that, because of original type certification or later increase in capacity, have:

- A maximum type-certificated passenger capacity of 30 or more, or
- A maximum payload capacity of 3400 kg or more

**B. “Original Type Certification or Later Increase in Capacity.”** The phrase “original type certification or later increase in capacity”, (as found in GACAR § 121.473) addresses two situations. In the past, some DAHs and operators avoided applying requirements mandated only for airplanes over a specific capacity by receiving a design change approval for a slightly lower capacity. By referencing the capacity resulting from original certification, the rule removes this means of avoiding compliance. Also, the airplane could have been originally certificated with a capacity slightly lower than the minimum specified in the rule, but through later design changes, the capacity could be increased above this minimum. The reference to later increase in capacity in the rule ensures that, if this occurs, the design would have to meet the requirements of the rule.

### 4.3.7.11. DESCRIPTION OF EWIS ICA.

**A. Inspection or Restoration Tasks.** EWIS ICA are either inspection or restoration tasks which include intervals, methods, processes, and procedures to keep the EWIS airworthy throughout its operational life. The inspection can be a zonal General Visual Inspection (GVI), stand-alone GVI, Detailed Inspection (DI), or a combination of these. A restoration task is usually a cleaning task, but it can also be a task such as replacing an air filter in order to reduce the likelihood of contamination buildup within a zone. The type-certificate holders (TCH) or applicant typically develop these EWIS ICA using the Air Transport Association of America (ATA) Maintenance Review Board (MRB) process and FAA AC 25-27, (as amended). The STC holders may use FAA AC 25-27, (as amended) to develop their EWIS ICA.

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**B. Multiple Components.** EWIS ICA can be, and almost always are, comprised of several different components. All of these components together define a particular EWIS ICA. The components of EWIS ICA are located in multiple TC/STC holder-produced documents.

1) As an example, EWIS ICA components can be located in a:

- Document required by GACAR Part 25 appendix H, § 25.5(b), commonly referred to as “source document”
- Maintenance Review Board Report (MRBR)
- Maintenance Planning Document (MPD)
- Maintenance Implementation Document (MID)
- Aircraft Maintenance Manual (AMM)
- Standard wiring practice manual (SWPM)
- Electrical standard practices manual (ESPM) (a term used by some TC/STC holders)
- Stand-alone ICA document produced by an STC applicant

2) These components are items such as:

- Task reference number(s)
- Type of task (e.g., DET, stand-alone GVI)
- Task interval
- Applicability (i.e., model, engine type)
- Airplane zone identification
- Task description (e.g., perform a DET of the power feeders)
- Special or unique tooling requirements, such as borescope for isolated locations

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- Task procedures (i.e., instructions on how to perform the actual task)
- Access instructions
- Task supporting procedures as necessary, such as EWIS cleaning procedures and instructions for protection and caution information that will minimize contamination and accidental damage to EWIS during performance of maintenance, alterations, or repairs

**C. Source Document.** GACAR Part 25, Appendix H, paragraph H25.5(b) states that the EWIS ICA developed in accordance with the requirements of GACAR Part 25, Appendix H, paragraph H25.5(a)(1) must be in the form of a document appropriate for the information to be provided and must be easily recognizable as EWIS ICA. This document must either contain the required EWIS ICA or specifically reference other portions of the EWIS ICA that contain this information. This document is referred to as the source document. GACAR Part 25, Appendix H, paragraph H25.5(b) does not prescribe a specific data form. The form is at the discretion of the TC/STC holder, as long as it meets the requirements of GACAR Part 25, Appendix H, paragraph H25.5(b). The entire EWIS ICA can be in the source document, or the source document can point to a series of other documents, such as the MRBR, MPD, MID, AMM, or SWPM/ESPM, which contain the EWIS ICA. Those sections and only those sections of the other documents (i.e., MRBR, MPD, MID, AMM, or SWPM/ESPM) that contain parts of the EWIS ICA are GACA/FAA-approved. The GACA or FAA Oversight Office will approve the source document, which the operators can use as a method of compliance.

- 1) The TC/STC holder will revise the source document as new or revised EWIS ICA. They will then provide the revised source document to operators after the document has been approved by the GACA or FAA Oversight Office.
- 2) GACAR § 121.473(e) requires that any EWIS maintenance program changes identified in subparagraphs (c) and (d) of those sections and any later revisions be submitted to the responsible PI for review and approval. The responsible PI will approve the incorporation of the EWIS ICA into the operator's maintenance program using OpSpec D97. The operator should have procedures in its Maintenance Manual (MM) to notify the PI when EWIS ICAs are revised by the TC/STC holder or the operator.

**D. Controlling Reference Numbers.** Controlling reference numbers for the individual EWIS

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ICA tasks are listed in the MRBR, MPD, MID, or other maintenance documents. An example of a controlling reference number in an MRBR is “MM/MPD ref. 20-60-04.” This number correlates to the same number in the AMM, which is the actual maintenance task with all associated instructions to accomplish it. The TCH may refer to these reference numbers as MRB reference, AMM/MPD reference, Maintenance Significant Items (MSI) reference, task number, etc. It can vary from one TCH to another TCH. The TCH should consider and identify all numbers that are necessary to fully identify and track the EWIS ICA as part of the ICA and must identify them.

**E. Specific Items.** The example controlling reference number identified in subparagraph D above, has five specific items that directly correlate to it. Those items are listed below. PIs should be mindful that while this example has five items that are part of the EWIS ICA, other controlling reference numbers may have fewer or more.

- 1) The type of task (restoration/cleaning, stand-alone GVI, and/or DET) as identified in the MRBR, MPD, and MID.
- 2) The airplane zone identification for airplanes with a zonal program (e.g., Zone 201). Task description as described in the MRBR and MID (e.g., “Inspect (General Visual) all exposed EWIS in the wheel well. *NOTE: (Gear extended with handle down and locked position and doors in open position.)*”)
- 3) The task procedure(s), as described in the referenced AMM or other documents that contain the procedure(s). This is the actual instruction on how to perform the GVI, DET, and/or restoration/cleaning tasks that support the task description listed in the MRBR, MPD, and MID.
- 4) The supporting task procedure(s), if any, necessary to perform the task procedure in any other document referenced by the task procedure.
- 5) The instructions for protections and caution information that will minimize contamination and accidental damage to EWIS (these can appear in different places, such as in the AMM or in the SWPM/ESPM). This information, if contained in the SWPM/ESPM (or other similar documents), will be in its chapter 20. Sometimes this information is repeated in the standard practices chapter 20 of the AMM. In any case, it is general protection and caution information and it is not expected that unique procedures will be developed for individual EWIS ICA for a particular airplane model or even models produced by the same manufacturer. The AMM or SWPM/ESPM will reference any protection and

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caution information specific to EWIS ICA.

### **F. PMI Action.**

- 1) PMIs must review and familiarize themselves with the source document and all maintenance documents identified in subparagraph C above, that pertain to the specific airplane model(s) in the operator's fleet.
- 2) The PMI must also ensure that the operator has properly identified and accounted for all of the components of each EWIS ICA identified in the source document and that all components are included in the operator's maintenance program, including maintenance manuals, job/task cards, and engineering order/authorizations where appropriate.

#### **4.3.7.13. OPERATOR INCORPORATION OF EWIS ICA INTO THE MAINTENANCE**

**PROGRAM.** GACAR § 121.473 requires the operator's PMI to review and approve incorporation of the TC/STC holder EWIS ICA or other applicable EWIS ICA approved by the GACA or FAA Oversight Office into the operator's maintenance program using OpSpec D97. This includes revisions to the EWIS ICA.

### **A. PMI Action for Inspection Tasks/Intervals.**

- 1) PMIs must ensure that the operator incorporates these TC/STC holder inspection tasks and task intervals into its maintenance program (i.e., time limitations manual, AMM, SWPM/ESPM, job/task cards, and any other documents the operator may use in administering its maintenance program, such as engineering orders/authorizations).
- 2) If the operator proposes changes to the initial TC/STC holder inspection tasks and task intervals, the operator must submit its proposed changes along with supporting technical justification/data to the PMI, who may add comments and forward them to the Director, Airworthiness Division for approval.
- 3) The GACA will respond to the operator and copy the PMI on the approval/disapproval letter.
- 4) PMIs should ensure that the operator has procedures in its manual to notify the PMI of any revisions to the TC/STC holder inspection tasks and intervals.

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**B. Instructions and Procedures.** The GACA or FAA Oversight Office-approved instructions/procedures to perform the EWIS tasks will be contained in the TC/STC holder source document, AMM, SWPM/ESPM, and in their applicable job/task cards. Operators must incorporate these instructions/procedures into their appropriate manuals and job/task cards.

**C. PMI Action for Instructions and Procedures.** PMIs must ensure that the operator incorporates the TC/STC holder instructions and procedures to perform the EWIS task into its AMM, SWPM/ESPM, and job/task cards and any other documents the operator may use in administering their maintenance program, such as engineering orders/authorizations as applicable.

**D. Protection and Caution Instructions/Information.** The EWIS ICA also include protection and caution instructions/information that will minimize contamination and accidental damage to EWIS during the performance of maintenance, alterations, or repairs. The TC/STC holders have developed these protection and caution instructions/information to support the EWIS maintenance program for the airplane. STC holders may develop their own protection and caution instructions/information, or they may choose to use the TCHs'.

- 1) These protection and caution instructions/information will be in the source document, AMM, or SWPM/ESPM. They are GACA or FAA Oversight Office-approved.
- 2) It is important that the operator apply these protections and cautions to minimize contamination and accidental damage to EWIS when performing maintenance, alteration, or repairs. It is also important to clean the EWIS and surrounding area after completion.
- 3) These protection and caution instructions/information must be incorporated into the operator's maintenance program.

**E. PMI Action Protection and Caution Instructions/Information.**

- 1) The PMI must ensure that the operator incorporates the TC/STC holder protection and caution instructions/information into its AMM, SWPM/ESPM, job/task cards, and any other documents the operator may use in administering their maintenance program, such as engineering orders/authorizations, as applicable.
- 2) If the operator develops its own protection and caution instructions/information that are different from that identified in the TC/STC holder documents, then the operator must request

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that those new/different protection and caution instructions/information be approved by the GACA.

- a) For example, the TC/STC holder might call out a specific cleaning procedure, cleaning solution, or cleaning materials for the area to be inspected. The operator decides that it wants to use something different from what is provided by the TC/STC holder. In this case, the operator must request approval from the GACA.
- b) Operator-developed job/task cards that include EWIS should have the protection and caution information and instructions included on the job/task card or should reference the location in the AMM or SWPM/ESPM so that the person performing the task can locate them.

### **4.3.7.15. STC HOLDER-DEVELOPED EWIS ICA.**

**A. New or Amended STC Applications.** GACAR § 26.11 requires new or amended STC applications to be evaluated and, if necessary, develop and submit the necessary revisions for review and approval to the GACA. If an operator develops its own STC, which creates new EWIS ICA, the GACA must approve them. This approval will be managed by the GACA Airworthiness Engineering Section during the GACA STC project.

#### **B. PMI Action.**

- 1) The PMI must ensure that the operator has included any GACA-approved STC EWIS ICA changes into its maintenance program.

### **4.3.7.17. REQUIREMENT TO ENSURE COMPATIBILITY BETWEEN FTS AND EWIS ICA.**

**A. Purpose.** The GACARs require the TC/STC holders to review any fuel tank system ICA developed to comply with Fuel Tank System Fault Tolerance Evaluation Requirements. This ensures compatibility with the enhanced zonal analysis procedure (EZAP)-generated EWIS ICA and minimizes duplication of requirements between them (refer to FAA AC 120-102, appendix 2 for more information on EZAP). Fuel tank wiring is part of the EWIS. The fuel tank system maintenance and inspection requirements might be more specific than those for wiring in general, and might contain additional requirements.

#### **B. PMI Action.**

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- 1) The PMI must be aware that the separation and configuration of EWIS, especially when performing a repair or alteration to the EWIS or fuel tank system wiring, may be critical. Further, the GACA must approve any operator changes to separation and configuration of EWIS or fuel tank system wiring.
- 2) The PMI must also be aware that critical design configuration control limitations (CDCCL), which have been mandated by an Airworthiness Directive (AD), affect fuel tank system wiring.
- 3) The PMI must ensure that the operator has procedures in its manual that ensure separation and configuration control when performing repairs or alterations to EWIS and FTS wiring.

### **4.3.7.19. OPERATOR INCORPORATION OF EWIS ICA INTO THE MAINTENANCE PROGRAM.**

**A. Operational Rule Requirements.** GACAR § 121.473 requires operators to incorporate EWIS ICA (inspections and procedures), which include inspection tasks, task intervals, instructions/procedures to accomplish those tasks, and protection and caution instructions/information for the EWIS, into their maintenance program.

**B. Operator's Tracking System.** The operator's tracking system must track the initial incorporation as well as revisions within its maintenance program so that the ICA will not lose their identity as GACA-approved ICA. This includes:

- Tasks and intervals
- Instructions/procedures in the AMM and SWPM/ESPM
- Protection and caution instructions/procedures in the AMM and SWPM/ESPM

**C. PMI Review.** The PMI must ensure that the operator has a means to assess the tracking of EWIS ICA to ensure the incorporation of revisions to them in the maintenance program.

**D. Controlling Reference Numbers.** The TCH's controlling reference numbers uniquely identify the EWIS ICA for identification and traceability purposes throughout the operational life of the airplane. During the initial operator incorporation of these EWIS ICA into its maintenance program, the operator should use these controlling reference numbers or an operator-developed

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system that correlates to these numbers for the purposes of traceability. This will help prevent inadvertent deletion, changes to the type of task, or escalation of EWIS ICA without proper consideration of the reason for the task and its interval.

**NOTE:** The tracking system should correlate to the controlling reference number for the EWIS ICA and be acceptable to the PMI.

### **4.3.7.21. CHANGES TO OPERATOR'S EWIS TASK OR INTERVALS .**

**A. Types of Changes.** There are two types of changes to the operator's EWIS tasks:

- Deletion of or changes to an EWIS task; or
- Escalation of an airplane check interval, such as “C check” containing EWIS tasks and intervals

**B. GACA Approval.** If the operator proposes to delete or change an EWIS task, it must request approval from the GACA.

**C. PMI Action.**

1) If the operator proposes to delete or change an EWIS task, it must submit any proposed changes along with technical justification/data through the PMI. The PMI adds comments, if any, and forwards the proposed changes and data to the Director, Airworthiness Division for approval.

2) The PMI must review the operator's submittal and ensure that the technical justification/data is fundamentally sound before providing comments for the Director to review. For example:

- a) Is the proposed deletion because the task is already part of an existing task within the operator's maintenance program, thereby being duplicative?
- b) Is the proposed change because the operator has a different or more efficient way of accomplishing the task? If so, the operator needs to explain in its proposal how the change is different or more efficient without compromising the intent of the original task or safety.

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**D. Escalation of an Airplane Check Interval.** If the operator proposes an escalation of an airplane check interval such as the “C check” that contains EWIS tasks and intervals, the PMI has the authority to approve the change.

### 4.3.7.23. EWIS TRAINING PROGRAM.

**A. Operator Maintenance Training Programs.** To realize fully the objectives of EAPAS/FTS requirements, the GACA encourages operators to rethink their current philosophical approach to maintaining, inspecting, and altering aircraft wiring and systems in the aircraft. The GACA has adopted the “Protect and Clean as You Go” philosophy. This philosophy stresses:

- 1) The importance of protective measures when working on or around wire bundles and connectors; and
- 2) The importance of protecting EWIS during structural repairs, STC installations, or other alterations by making sure that metal shavings, debris, and contamination resulting from such work are removed during work in progress and after completion.

**B. Application.** The operator can apply this philosophy to aircraft wiring through the inclusion of protection and caution instructions/information in the AMM, the SWPM/ESPM, and FAA AC 25-27 (as amended). This philosophical approach begins at the airplane manufacturer with maintenance program enhancements, maintenance manual changes, and maintenance training programs. In addition, there will be new maintenance manual and job card procedures, inspection devices, graphical information showing required tasks, or changes in tasks such as wiring splicing. Operators should provide training to maintenance, inspection, and engineering personnel, including persons who write and edit job cards and engineering orders. They should ensure that their contract maintenance providers are included. The FAA published the current edition of FAA AC 120-94 (as amended), Aircraft Electrical Wiring Interconnection Systems Training Program, to assist operators in development of EWIS training programs.

**C. Fuel Tank System Wiring.** Operator maintenance training programs should emphasize the EWIS as a system on the aircraft that includes fuel tank system wiring. In this case, the requirements for fuel tank system maintenance and inspection might be more specific than those for wiring in general, and might contain additional requirements that protect the fuel tank system ignition prevention features. The operator must maintain, inspect, and repair all EWIS in accordance with the AMM, the SWPM/ESPM, or other GACA-accepted methods, techniques, and practices.

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**D. PMI Action.** The PMI will monitor the operator's maintenance training program to determine if the operator's training curriculum conforms to the guidance in this handbook section and FAA AC 120-94 (as amended). The PMI should encourage the operator to incorporate appropriate parts of both documents into its training program.

**4.3.7.25. TASK OUTCOMES.** If not already accomplished, document that the operator has successfully incorporated the TC/STC holder's EWIS ICA into its maintenance program by approving the incorporation on OpSpec D97.

**A. Complete the GAR.**

**B. Ongoing Surveillance.** To ensure that the operator continues to comply with its EWIS requirements, conduct normal surveillance activities.

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#### **CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125**

##### **Section 8. Evaluating Proposed Adjustments to Task Intervals/Time Limitations for Maintenance Programs**

###### **4.3.8.1. GACA ACTIVITY REPORT (GAR).**

A. TBD (AW)

###### **4.3.8.1 GACA ACTIVITY REPORT (GAR).**

A. TBD (AW).

**4.3.8.3. PURPOSE.** This section provides guidance for an aviation safety inspector (Inspector) on how to evaluate proposed task interval/time limitation adjustments for maintenance programs. An operator may need to extend or reduce (optimize) its task intervals/time limitations depending on its aircraft utilization, in-service reliability, and environmental conditions operated in. In this section, the term “operator” refers to an air carrier operating under GACAR Part 121 or Part 135 that has a Continuous Airworthiness Maintenance Program (CAMP).

###### **4.3.8.5. GENERAL.**

**A. Continuous Airworthiness Maintenance Programs (CAMP).** The guidance in this section applies to operators who have a maintenance program. An operator must ensure its CAMP is sufficiently comprehensive in scope and detail to fulfill its responsibility to maintain its aircraft in an Airworthy condition that meets its type design or is in a properly altered condition for safe flight. An operator must maintain its aircraft, component parts, accessories, and appliances in accordance with the time limits for accomplishing the overhaul, replacement, periodic inspection, and routine checks. The operator’s operations specifications (OpSpecs) or a document referenced in these OpSpecs will contain the time limits or standards for determining the time limits.

**B. Low-Utilization Aircraft.** Low utilization is addressed in some Maintenance Review Board Reports (MRBR), and some Original Equipment Manufacturers (OEM) have identified a low utilization as 100 flight-hours (FH) or less monthly. OEMs recommend operators adjust their

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maintenance program from a FH-based to a calendar-based process for a low-utilization program. When operating a low-utilization aircraft, the operator should contact the OEM for a low-utilization maintenance program.

**C. High-Utilization Aircraft.** Operators of high-utilization aircraft perform maintenance requirements much more frequently than those aircraft operated within the average time limits for the aircraft projected at type certification. This not only may have a depreciative effect on the aircraft, but it also results in higher operating costs. To ensure that an operator accomplishes maintenance consistent with its operations, the operator should contact the OEM for a high-utilization maintenance program.

### 4.3.8.7. ADJUSTMENTS TO TASK INTERVALS/TIME LIMITATIONS.

**A. Operators with an Approved Maintenance Reliability Program.** Maintenance reliability programs allow operators subject to a CAMP to adjust the time limitations or standards for determining intervals between overhauls, inspections, and checks without prior GACA acceptance. Operators who have an authorized maintenance reliability program should follow that program's procedures when adjusting task intervals/time limitations.

**B. Restrictions on Task Interval/Time Limitation Extension Adjustments.** The following intervals may not be extended without approval from the GACA.

- 1) Intervals specified by Airworthiness Directives (AD) (an alternate method of compliance (AMOC) is required when extending intervals specified in an AD).
- 2) Life-limited items.
- 3) Airworthiness limitation items (ALI).
- 4) Certification Maintenance Requirements (CMR) (unless specifically allowed and designated by the CMR document).
- 5) Structural sampling periods that the MRBs impose.
- 6) MRBR Failure Effect Categories 5 and 8.
- 7) Critical design configuration control limitations (CDCCL).

### 4.3.8.9. REFERENCES, FORMS, AND JOB AIDS.

#### A. References (current editions):

- GACAR Parts 121 and 135.
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- FAA Advisory Circular (AC) 121-22, Maintenance Review Boards, Maintenance Type Boards, and OEM/TCH Recommended Maintenance Procedures.
- FAA AC 120-16, Air Carrier Maintenance Programs.
- FAA AC 120-17, Maintenance Control by Reliability Methods.

**B. Forms.** None.

**C. Job Aids.** None.

### **4.3.8.11. PROCESSING A PROPOSED TASK INTERVAL/TIME LIMITATION ADJUSTMENT.**

#### **A. Determine the Length of the Adjustment.**

- 1) You and the operator must collaborate to determine a reasonable length for the task interval/time limitation adjustment. The length of the adjustment should allow the operator to revise its maintenance program or time limitations document without compromising aviation safety. An operator should base its task interval/time limitation adjustment on in-service data collected from a representative sample size of tasks from the operator's aircraft fleet, which spans all operating environments. The sampling should be derived from at least 10 percent of each aircraft fleet type the adjustment will affect.
- 2) An operator may adjust intervals for individual tasks or for a complete inspection package. However, if an operator requests to adjust intervals for a complete inspection package, an operator must provide a comprehensive justification for the interval adjustments on a task-by-task basis. Justification for adjusting any individual task or inspection package intervals requires analyzing a mutually agreed upon representative sampling of completed inspections and analyzing all routine, nonroutine, and teardown report findings generated during those inspections.
- 3) Task interval/time limitation adjustments may be a percentage of an existing time interval for a particular task, or may be designated in hours of time in service, cycles, calendar-time, or some other identifiable increment. Operators must describe in their manual the methods and procedures for calculating task interval/time limitation adjustments.
- 4) Examine the following documentation to support justification for the proposal, and any pertinent data to its operations identified in subparagraphs 4.3.8.11.B3)b) through e) of this section:

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- a) Aircraft/engine utilization information, a summary of fleet-wide service experience (hours, cycles, years), time in service, and daily utilization (high, low, average).
  - b) Revised MRBRs for transport category aircraft only if the operator is requesting to use the new MRBR intervals.
  - c) All manufacturer's information related to the task interval/time limitation (e.g., Service Bulletins (SB), Service Letters (SL), and other in-service reports/resolutions, as applicable).
  - d) Recommendations from the operator's aircraft, engine, propeller, component, or emergency equipment maintenance provider detailing any possible task interval/time limitation adjustments.
  - e) Information regarding component removal and replacement activity and vendor repair maintenance records.
  - f) Past operating experience (including Continuing Analysis and Surveillance System (CASS) analysis reports) and the maintenance history of the applicable aircraft, engines, propellers, components, or item of emergency equipment.
  - g) Overhaul teardown reports from the operator's aircraft, engines, propellers, or components that show dimensional checks and condition of critical parts. The operator should have operated any engine that it chose for teardown to within 5 percent of the currently approved time in service interval.
  - h) Engine oil analysis reports. Review the operator's oil analysis reports (if applicable) for abnormal wear and recommendations from the lab for follow-up action. Repeat abnormal wear reports may indicate a problem with the operator's engine maintenance program.
  - i) Engine trend monitoring reports. If the operator has a trend monitoring program, review it for abnormalities that would indicate a problem with the operator's engine maintenance program.
  - j) The oil consumption history. This is the history of oil consumption throughout the engine's operation since its last overhaul.
  - k) Pilot Reports and maintenance reports of mechanical irregularities and the resulting corrective actions.
  - l) Routine maintenance tasks that generate no findings. Tasks that generate no findings are as important as tasks that do generate findings.
  - m) Routine maintenance tasks that generate findings, which involve structures, zonal areas, and aircraft systems.
  - n) Any other data necessary to substantiate the task interval/time limitation
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adjustment.

- o) Method of monitoring, collection of data and analyzing, specifically with the interval/limitation adjustment over the time period to ensure the anticipated results.

Note: It is the operator's responsibility to provide the GACA with adequate information to justify all aspects of the proposed task interval/time limitation adjustment. The operator must have obtained the information from its own in-service experience and maintenance programs for that particular aircraft type, not from another operator's experience or programs with that same aircraft or aircraft type.

### **B. Evaluate the Proposed Adjustment.**

- 1) If the operator wants a task interval/time limitation adjustment, it should submit its proposal in writing to the GACA.
- 2) The Inspector must collaborate with the GACA Airworthiness Engineers for escalation approval on the applicable items listed in subparagraph 4.3.8.7.B.
- 3) Depending on the type of aircraft or engine, the items that the Inspector should review may include:
  - a) Any information the operator provides that is relevant to the proposed task interval/time limitation adjustment.
  - b) Operators may use a change/revision to the MRBR solely to justify a change to their maintenance program as long as the operator has no data contradiction the MRBR change.
  - c) Mechanical Interruption Summary Reports (MISR). Review previous MISRs to detect trends or irregularities. This may indicate problem areas in maintenance procedures, operational procedures, or the operator's training with regards to the reliability of its aircraft.
  - d) Service Difficulty Reports (SDR). Query the SDR database for information on the component the operator wants to extend. A high number of reports, failures, or other deficiencies may be a reason to reject a task interval/time limitation adjustment.
  - e) AD records. Some ADs may restrict operating an aircraft, engine, propeller, or component past the manufacturer's recommended task interval/time limitation.
  - f) Type Certificate Data Sheets (TCDS). Review the TCDSs for any information related to

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task interval/time limitation adjustments. The TCDSs may also reference life limits.

g) Operator's violation history. Review the operator's current status and history for any maintenance-related violations, information, and data when analyzing the risk for the proposed task interval/time limitation adjustment.

h) Operator's accident, incident, and occurrence history. If the operator has a history of accidents, incidents, or occurrences related to maintenance issues, this may also be a factor when analyzing the proposed task interval/time limitation adjustment.

**C. Analyze the Findings.** You should collaborate with members of the Certificate Management Team (CMT) to analyze the findings from the review of the proposed task interval/time limitation adjustment.

Note: Operators may submit a change/revision of an MRBR as justification to change their maintenance program, but must be supported by the operator's previous operating data and no data contradicting the MRBR change. All submissions should provide data that include maintenance defects/findings, defects resolutions, recurring defects, corrective actions, mitigation actions, risk analysis, and acceptance plans. An operator that cannot provide adequate data to support the submissions may have an underlying maintenance program concern.

**D. Perform a Risk Analysis and Determine Acceptance/Rejection.** Perform a risk analysis to determine if the operator can adjust task intervals/time limitations without compromising safety.

1) Rejection. If the risk analysis determines that the operator's safety culture or operating practices present an unacceptable safety risk, you should reject the proposed task interval/time limitation adjustment.

2) Acceptance. If the risk analysis determines that the operator can accept any assessed risk without further action, and the operator can provide service with the highest possible degree of safety, you may accept the proposed task interval/time limitation adjustment, excluding items in subparagraphs 4.3.8.7.B1) through 7).

**E. Debrief the Operator.** Debrief the operator by discussing the evaluation results of the proposed task interval/time limitation adjustment. Also discuss any risks identified during the risk analysis.

### 4.3.8.13. TASK OUTCOMES.

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### A. Complete the GAR.

**B. Complete the Task.** Completing this task results in one of the following:

**1) Rejection.** If you determine the proposed task interval/time limitations adjustment is unacceptable, notify the operator by letter that the GACA rejects its proposal. The letter should include the reasons for the rejection. In addition, return all the documentation the operator submitted.

**2) Acceptance.** If you determine that the task interval/time limitation adjustment proposal is acceptable and continuous safe operation can be achieved, accomplish the following:

- a) Notify the operator by letter that the GACA accepts the proposed task interval/time limitation adjustment. The operator should then revise its OpSpecs, maintenance program, and/or time limitations document following the procedures outlined in its manual.
- b) Update the appropriate OpSpec, as necessary.

### 4.3.8.15. FUTURE ACTIVITIES.

**A. Periodic Checks.** Periodically review the operator's maintenance program records for any trends resulting from the task interval/time limitation adjustment.

**B. Continual Monitoring.** Monitor the operator's maintenance program after any task intervals have been adjusted to ensure the same level of safety and reliability is maintained. The operator should include some type of specific monitoring of any task interval/time limitation adjustment in its CASS program.

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#### **CHAPTER 3. CONTINUOUS AIRWORTHINESS PROGRAMS FOR PARTS 121 AND 125**

##### **Section 9. Evaluating an Airworthiness Directives Management Process**

###### **4.3.9.1. GACA ACTIVITY REPORT (GAR).**

A. TBD (AW)

**4.3.9.3. OBJECTIVE.** This section provides aviation safety inspectors (Inspector) with information to evaluate an operator's Airworthiness Directive (AD) management process. The guidance in this section and the current edition of FAA Advisory Circular (AC) 39 9, Airworthiness Directives Management Process, outlines a way an operator may develop an AD management process.

###### **4.3.9.5. GENERAL.**

**A. AD Management Process.** The AD management process explained in this section presents a tangible means an operator may assess and respond to ADs. However, individual operations and needs should determine an operator's AD management process. When developing an AD management process, operators should consider their size, capabilities, resources, and equipment.

**B. AD Process Evaluation.** It is the Inspector's responsibility to determine if an operator has an effective AD management process. This is done by evaluating the operator's process to determine if all pertinent elements of an AD management process are defined. When deficiencies are detected, an Inspector should address these matters with the operator. The Inspector may require the operator to make necessary manual changes when determining compliance to GACAR § 121.691, a section that discusses Continuing Analysis and Surveillance (CAS).

**C. Current ADs.** In order to perform adequate oversight, Inspectors should remain aware of new ADs by consulting the appropriate websites of the State of Design.

###### **4.3.9.7. BACKGROUND.**

**A. AD Issuance.** GACAR Part 39 prescribes the rules concerning ADs applicability for Saudi Arabian registered aircraft. GACAR Part 39 outlines that ADs issued by the GACA, the FAA

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and the State of Design (if different than the United States) all may apply to a Saudi Arabian registered aircraft. The GACA, the FAA and/or the State of Design of an aeronautical product issues ADs when an unsafe condition is found to exist in a product and which is likely to exist or develop in other products of the same type design. ADs are used to notify aircraft owners and operators of unsafe conditions and the actions required to resolve those conditions.

NOTE: To ensure continued airworthiness, concerns regarding ADs should be addressed in a logical and comprehensive manner. This can be accomplished by operators developing robust AD management processes, which should encapsulate all six elements discussed in the remaining paragraphs of this section.

**B. Service Bulletins (SB) Incorporated by Reference (IBR) into ADs.** The following provides background and general information related to best practices for SB related to an AD. The action(s) specified in an AD are intended to detect, prevent, resolve, or eliminate the unsafe condition. Those actions can either be written directly into the regulatory portion (“body”) of the AD, or another document, such as a SB, can be referenced in the AD body. Compliance with a SB that is IBR by an AD is mandatory.

**1) Safety Intent and Configuration Description.** An SB IBR in an AD may contain paragraphs entitled “Safety Intent,” and for ADs that will change the configuration of a part, “Configuration Description.” These paragraphs are intended to enhance and focus awareness of the safety issue during the development and approval of the SB as well as during implementation and subsequent maintenance. The “Safety Intent” paragraph should explain what accomplishment of the SB is intended to do (i.e., prevent, resolve, or otherwise remove the unsafe condition). The paragraph should be a concise and clear statement of the specific technical objective of the instructions. If accomplishing the SB will change configuration, a “Configuration Description” paragraph should be included to provide a concise, high-level description of the design change that will result from accomplishing the instructions. The “Configuration Description” should be limited to the features that will prevent development or recurrence of the unsafe condition once the configuration has been implemented. The “Configuration Description” may guide, but cannot be used as the final determinant of compliance with an AD.

**2) Critical Task Differentiation.** An SB referenced in an AD may identify steps that have a direct effect on detecting, preventing, resolving, or eliminating the unsafe condition, with “RC” (required for compliance). Any substitutions or changes to RC steps will require an

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alternative method of compliance (AMOC) approval. Differentiating these steps from other tasks in a SB will improve an owner/operator's understanding of crucial AD requirements and help provide consistent judgment in AD compliance. In older ADs, the term "RC" is not used and all steps are mandatory. An AMOC is required for any substitution or change desired by the owner/operator.

**4.3.9.9. RECOMMENDED PROCEDURES FOR DEVELOPING AN AD MANAGEMENT PROCESS.** There are many distinct internal processes, controls, and actions necessary for AD compliance planning, implementation, and auditing. The remaining paragraphs of this section describe common processes and practices to manage ADs. The AD management process can be categorized into six elements:

- Planning.
- Support.
- Provisioning.
- Implementing.
- Recording.
- Auditing.

**4.3.9.11. PLANNING.** The planning element ensures awareness and assigns responsibility for AD requirements. The planning element may include a review of:

- The AD.
- Referenced documents.
- Engineering.
- Materials.
- Scheduling.
- Recordkeeping.
- Maintenance execution.
- Quality control (QC).
- Quality assurance (QA).

**A. AD Configuration Control Board (CCB).** An operator's planning element may include an AD CCB that has regular meetings, or equivalent, where action plans are reviewed, coordinated, and assigned. The plan should identify the details (i.e., who, what, when, where, and how) regarding affective AD compliance. These meetings may help ensure all affected departments of the

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operator are aware of their responsibilities and where acknowledgement of those responsibilities is recorded.

NOTE: Some operators may have fewer resources than others; therefore, a single individual or department may conduct AD planning functions.

**B. AD Planning Meetings.** The operator may request/invite Principle Maintenance Inspector (PMI) to the AD planning meeting. Therefore, the operator may develop a process for notifying and inviting its PMI prior to AD planning meetings. When the operator brings forth issues, concerns, or clarification requests, the Inspector serves as an observer and a coordinator, and ensures that the appropriate GACA officials are consulted and their recommendations/guidance is provided as feedback to the operator.

NOTE: Participation of an Inspector is at the request of the operator. The Inspector does not provide concurrence/approval of an operator's compliance decisions.

**C. Identifying Risks.** The planning element is an appropriate venue to determine what verification process may be needed to identify risk, which would ensure continued compliance with ADs. An effective planning element should determine if an AD is applicable to the operator. The planning element should also include a risk analysis that considers the conditions that could arise through implementation or configuration changes. These conditions, which could affect the probability of errors, may include:

- Operator's dynamics.
- ADs with a high risk of change.
- AD complexity (complex or workload intensive ADs may create greater error rates and higher risks).
- Accessibility/location.
- ADs with repetitive inspections.

### **D. AD Verification Process.**

1) Once these risks are analyzed, a possible AD verification process may be developed to include:

- Physical verification,
- Verification of records,

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- Meeting criteria for inclusion into a sampling program, and
  - A required one time verification (i.e., no future verifications are required).
- 2) An effective planning element should identify ADs that have the highest risk for potential alteration(s) during normal maintenance. Once a risk assessment is accomplished, prioritized ADs should continually be verified through an operator developed verification program.

**E. GACA Airworthiness Engineer Consultation.** The planning element should include consultation with the GACA Airworthiness Engineering section if clarification is needed. Complex AD concerns should be brought forward at this time and clarification should be shared with the operator. This is also an opportune time to determine if the contemplated actions will comply with the AD.

**F. AMOC Policy.** The extent and nature of appropriate AD compliance documentation and determining if an AMOC is required should be considered during the planning element. Inspectors must determine that the operator has a defined policy and procedure to identify and determine if an AMOC is necessary. The operator's AMOC policy should:

- Identify the specific requirements needed to obtain approval;
- When proposing an AMOC, consider making it for global distribution;
- When requesting design approval holder (DAH) assistance in obtaining an AMOC, provide permission to allow the DAH to pursue a global AMOC if appropriate;
- Identify personnel and their role in the process;
- Have a concise process to ensure deviations from AD requirements do not occur, unless the deviations have written approval (i.e., an approved AMOC); and
- Ensure AD compliance is recorded only after an approved AMOC has been accomplished.

NOTE: AMOC proposals, which can be submitted at any time during the AD management process.

**G. Communication.** As part of an AD management process, it is recommended that operators/air carriers develop a process to coordinate AD compliance matters with their local GACA office. This process may reference a conflict resolution process for circumstances that need an immediate resolution. Before agreeing to such a process, the GACA local office will ensure that the GACA's role, as defined in the process, is consistent with GACA policy.

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**H. Additional Areas of Consideration.** Some of the areas that an operator should consider during the planning element include:

- 1) Careful review of the AD with particular focus on any unique aspects of the AD. Does it require specific parts or articles that require long lead times? Does it impact future inspection schedules?
- 2) Determining any unique product or appliance aspects. Does the AD apply to the entire fleet or only particular products or appliances? Are there repairs or alterations on the product or appliance that might require an AMOC?
- 3) Evaluating the method of compliance as annotated in the maintenance records (e.g., task cards, engineering orders, engineering authorizations, etc.) to ensure AD requirements will be met.
- 4) Determining whether to use physical markings to identify areas where an AD is in effect.
- 5) Determining whether AD referenced service instructions have already been accomplished. Also, determine if any deviations occurred from the service instructions, which would require an AMOC.
- 6) Determining whether there should be changes to the Aircraft Maintenance Manual (AMM), an Illustrated Parts Catalog (IPC), or a Wiring Diagram Manual (WDM) to ensure continued compliance.
- 7) Ensuring rotatable spares and work performed in the shop are AD compliant and that noncompliant spares are not installed on compliant aircraft.
- 8) Determining the need for training and specific labor skills (e.g., avionics, Nondestructive Testing (NDT), structures, etc.).
- 9) Determining the restriction of AD accomplishment to site specific locations.
- 10) Determining the need for an enhanced perspective (i.e., a second set of eyes) at the point of implementation.
- 11) Determining when and how audit plans will be impacted for ADs that call for segmented actions.
- 12) Determining whether prototyping is needed and, if so, the persons or departments that will accomplish that process.

**4.3.9.13. SUPPORT.** The support element may consist of engineering, provisioning material, configuration control, etc. Not all operators will have in house engineering capabilities; however, they will have personnel responsible for coordinating and auditing technical documentation. Staff responsible for technical documentation may also be responsible for reviewing and evaluating information associated with an AD. The operators may also employ or use outside engineering staff.

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**NOTE:** The term “engineering” is used as a generic reference to a department or individual that performs this function.

**A. Establish the Method of Compliance.** The operator’s process should ensure that the AD method of compliance is concisely tracked and is included in maintenance records. Therefore, the operator should use the support element to establish the method of compliance with each AD requirement.

**B. Schedule Coordination.** The support element regarding configuration control may involve confirmation of forecasts and schedules to accomplish the work of AD implementation. The schedule coordination should preclude changes to the direction that was determined (e.g., omissions or changes to task cards).

**C. Organizational Structure.** Depending on the operator’s organizational structure, materials and scheduling/planning departments are responsible for ensuring the materials specified in the AD and engineering document are provided. Those departments should plan for adequate capacity and time to accomplish the AD requirement(s) in appropriate work environments with the required maintenance personnel.

**D. Deviations.** During accomplishment of AD mandated actions, it is sometimes necessary to use an AMOC to deviate from the provided work instructions. Deviations may be due to issues such as configuration differences, damage findings, oversize fastener requirements, material substitutions, or service instruction discrepancies. The operator should have a process in place, preferably during the planning phase of AD implementation, to support these alternative processes/procedures. This process often involves an engineering department capable of collecting and addressing the necessary changes and then coordinating those changes with the GACA, as required. In addition, having an engineering department as part of this process may identify potential fleet wide compliance or safety concerns and allow industry wide resolution.

**E. Engineering Review.** The operator’s engineering review should include a side by side, paragraph by paragraph comparison of all AD requirements against any compliance actions developed by the operator. The engineering review should:

- 1) Ensure that the operator’s method of compliance conforms to each element of an AD, or
  - 2) Identify if an AMOC is needed.
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**NOTE:** Obtaining direct input from the maintenance organization during the support element review of engineering authorized documents can help operators eliminate a single point failure risk.

**F. Prototyping.** If prototyping is needed, the AD management process should provide instructions to perform prototyping assistance and monitoring. Silent prototyping (i.e., witnessing a technician accomplish the instructions) is recommended.

### 4.3.9.15. PROVISIONING.

**A. Capabilities, Time, and Materials.** The operator's materials and scheduling/planning departments should ensure that the materials specified in the AD and/or AMOC are procurable and available at the scheduled time for AD accomplishment. A provisioning element should also ensure adequate time and capabilities are sufficient to accomplish the AD in an appropriate work environment with the required maintenance personnel, tooling, and equipment.

**B. Kitting.** An operator may develop or be able to purchase from the Original Equipment Manufacturer (OEM)/DAH a kit that consists of all the AD required parts and materials. This process is referred to as "kitting." The accuracy of the kit contents should be verified. Special attention should be made to ensure that part or material substitutions are only made with written approval from the GACA.

**C. AMOC Proposal.** If AMOCs are required for parts or material substitutions, the AMOC proposal should be coordinated in a timely manner so that all provisions of the AD are in compliance by the due dates.

### 4.3.9.17. IMPLEMENTING.

The implementation element is the result of finalized actions involved in the planning, support, and provisioning elements.

**A. AD Work Instructions.** Operators are responsible for accomplishing AD work instructions in accordance with their procedures. This is the sole responsibility of the operator regardless with whom they make arrangements for performing AD work instructions.

**B. Verify the Method of Compliance.** The Inspector's presence during the implementation element is an opportune time to verify and validate an operator's compliance method. However, the Inspector does not provide concurrence/approval of an operator's compliance method.

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**C. AD Accomplishment.** When evaluating an operator's prototyping process, the Inspector should pay attention to an AD's accomplishment with particular attention to determine whether the mechanic can understand and perform the actions required by the AD. If Inspectors believe there is a problem during prototyping, they should address their concerns to the operator's appropriate manager.

**4.3.9.19. RECORDING.** The recording element should include the option of archiving all planning, supporting, provisioning, and implementing element documentation, as well as validation audits.

**A. Maintenance Records.** Maintenance records establishing AD compliance must be maintained in accordance with regulatory requirements. Once a maintenance record is made showing AD compliance, the product must meet and continue to show compliance with required AD actions. When inspecting AD records, Inspectors will review the documents for compliance requirements listed below.

- 1) Identification of the particular airframe, aircraft engine, propeller, and appliance to which the AD is applicable.
- 2) AD compliance requirements including the current status of applicable airworthiness directives, including the date and methods of compliance, and, if the airworthiness directive involves recurring action, the time and date when the next action is required.

NOTE: Regarding the records for an AD, the "method of compliance" means a concise description of the action taken to comply with the requirements of the AD. If the AD or its service instructions permit the use of more than one method of compliance, the record must include a reference to the specific method of compliance used. When reviewing service instructions, place emphasis on the imbedded notes. If the operator uses an AMOC to comply with an AD, the method of compliance means a description of the AMOC and a copy of the GACA, FAA or the State of Design approval of the AMOC. For more guidance regarding recordkeeping, review the sections of this order that pertain to maintenance records.

**B. AD Record of Accomplishment.** Listing the current status of an AD or method of compliance should not be confused with an AD record of accomplishment. The AD record of accomplishment is a description of the work and the person who performed it on the product.

**4.3.9.21. AUDITING.** The main objective of an operator's auditing element is to provide a comprehensive method for continual verification and validation of AD compliance.

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**A. Compliance Validation.** An effective auditing element of the operator should have a concise method of auditing ADs for continued compliance. This method may range from periodic compliance validation to a sampling program. The auditing element should also have a written process and procedure with specific intervals identified.

**B. Validation Checks.** Validation checks are considered when there is a risk of altering mandated AD actions or when there are highly complicated requirements that cross many maintenance areas. Validation checks may include random sampling or physical validation. (Refer to FAA AC 39 9, Appendix 5, Sampling Program and Physical Verification.)

**C. Auditing Sub elements.** A comprehensive auditing element should include the following sub elements:

- 1) Audit Processing. A documented activity that assesses the effectiveness and efficiency of a series of related or sequential work activities.
- 2) Audit Scheduling. A program that establishes a schedule of events (SOE) to be performed during a set calendar period.
- 3) Audit Preparation. A plan that considers the resources needed to perform an audit, e.g., source documents, personnel, facilities, and access of equipment.
- 4) Audit Performance. A documented activity that determines whether the objective evidence of applicable AD management process elements are implemented and documented.
- 5) Audit Results Process. A process that includes:
  - A method to identify noncompliance and/or unsafe conditions that should result in immediate reporting and corrective measures to resolve noncompliance;
  - Describing audit findings and how they were discovered (results may be presented in terms of findings, concerns, observations, and recommendations);
  - Analyzing evidence to determine the root cause(s) of the finding;
  - Identifying planned corrective actions to take in response to the finding; and
  - Establishing a timeframe for putting corrective actions in place.

**D. Documentation.** Documenting all decisions made during the AD management process is encouraged so that appropriate measures can be taken and processes can be improved in case any issues arise.

NOTE: To evaluate an operator's Continuing Analysis and Surveillance System (CASS)

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performance verification and auditing as it relates to AD compliance, refer to eBook Volume 4, Chapter 3, Section 5, and FAA AC 120 79, Developing and Implementing an Air Carrier Continuing Analysis and Surveillance System.

### **4.3.9.23. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References (current editions):**

- GACAR Part 39. • FAA AC 20-176, Design Approval Holder Best Practices for Service Bulletins Related to Airworthiness Directives. • FAA AC 39-9, Airworthiness Directives Management Process. • FAA AC 120-79, Developing and Implementing an Air Carrier Continuing Analysis and Surveillance System.

**B. Forms.** None.

**C. Job Aids.** None.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 4. EVALUATE/AMEND AN OPERATING CERTIFICATE FOR PARTS 121, 125, AND 135**

##### **Section 1. Evaluate Air Operator Management Effectiveness**

**4.4.1.1. SCOPE AND CONCEPTS—GENERAL** The General Authority of Civil Aviation (GACA) is dedicated to, and the flying public expects, the highest degree of aviation safety. Accordingly, air operators must have as their highest priority the assignment and maintenance of safety. The issue of safety permeates both managerial competence and compliance disposition. This section describes the responsibilities of air operator management and the required methods of program implementation.

**A. Air Operator Management Responsibilities.** Air operator management has the responsibility for recognizing procedures and practices that fail to attain the goal of safety. However, it is not enough for an experienced and capable air operator management to be prepared to step in only when problems arise, nor is it enough for air operator management to correct problems only as they are brought to its attention by outside agencies such as the GACA. Management expertise entails taking a proactive role, not simply reacting to events. It requires taking the initiative to ensure a safe operation. It is not sufficient for management personnel to establish policies and procedures; they must also ensure that the policies and procedures are effective and that employees implement and follow them. Management may be held accountable for compliance problems, even if they do not have actual knowledge of the problems, while they should have known of the operator's safety and compliance deficiencies.

**B. Role of the GACA in Evaluating Air Operator Management Effectiveness.** Under the provisions of General Authority of Civil Aviation Regulation (GACAR) §§ 119.45 and 119.107, the GACA, when necessary, may inspect any air operator at any time and, if necessary, may amend, suspend or revoke an Air Operating Certificate (AOC), Operating Certificate (OC) and/or Operations Specifications (OpSpecs).

##### **4.4.1.3. MANAGEMENT OVERVIEW.**

**A. Safe Operations.** Air operator management has the responsibility to conduct safe operations and to ensure regulatory compliance. To achieve this purpose, air operator management must accomplish the following:

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- Establish and maintain an effective Safety Management System (SMS)
- Ensure that it possesses and maintains both the intent and ability to comply with the laws governing the airlines' operations, particularly the GACA's safety regulations
- Establish a high level management position to direct continuing analysis and surveillance program functions (This position shall have the authority to investigate, report, change inspection/ maintenance programs, require training, or change procedures as necessary to provide the high degree of safety mandated by the GACA)
- Ensure that personnel in positions such as check pilot, instructor, and those with required inspection item (RII) authority possess the higher level of responsibility necessary to perform to the standards incumbent on their positions
- Strive to exceed minimum GACAR requirements in all areas of air operator responsibility
- Acquire and utilize all of the elements needed for safe operation, including a competent and willing workforce
- Demonstrate the ability and willingness to work with the GACA to ensure continued safe operations

**NOTE:** Additional information regarding SMS can be found in Volume 2 of this handbook.

**B. Internal Evaluation Program.** Air operators must develop internal evaluation programs that continually audit and monitor company policies and procedures and ensure that the highest level of safety compliance is maintained. This auditing effort must also encompass those companies from which parts and services are procured.

**4.4.1.5. AIR OPERATOR RISK INDICATORS.** The GACA has identified certain risk indicators that are areas of concern in an operator's operations which may accompany potential safety deficiencies. Some of these indicators are as follows:

- Failure to prevent and correct operational problems that compromise safety
- Operational policies and programs that inhibit the ability to resolve safety-related problems

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- Repeated violation of regulations designed to ensure compliance with safety standards
- Increases in accidents, incidents, non-compliance, and emergencies
- Slow or incomplete implementation of new regulations and programs
- A major change in operating scope, such as significant route expansion, fleet expansion, and introduction of new aircraft or personnel
- Corporate and management problems, such as poor or non-existent internal audit procedures and limited experience levels of management personnel
- Significant increases in employee turnover
- Financial or labor/management problems, such as bankruptcies
- Major increases in lease activity
- Corporate mergers

**4.4.1.7. EMPHASIS AREAS.** A safe and compliant operation includes a trained and experienced work force, adequate technical guidance, adequate time for maintenance, and an effective quality assurance program. Trends that negatively affect safety may be identified through inspections conducted by the GACA. Some standard areas of inspection are as follows:

- Training programs
- Manuals and procedures
- Recordkeeping systems
- Flight and rest times
- Operational control
- Use of minimum equipment lists (MEL) and configuration deviation lists (CDL)

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**4.4.1.9. TRAINING PROGRAMS.** Training programs are systems of instruction that include curriculums, facilities, instructors, instructional delivery methods, and testing and checking procedures. A program must satisfy the training requirements of the GACARs and ensure that each employee remains adequately trained for each aircraft operation in which that person serves. Management personnel with oversight responsibilities for training must be actively involved with the respective program(s).

**A. Effectiveness.** Effective training of all personnel is critical in order for an operator to gain and maintain the highest level of proficiency and safety.

**B. Need for Flexibility.** All air operator operations are directly influenced by changes within the company or in industry in general. These changes will normally result in a need to revise training curriculums. Changes that may dictate revision of training include the following:

- Management personnel
- Regulatory requirements
- Equipment
- Financial status
- Scope of operation
- Public demands

**C. Evaluation.** When any one or more of the above changes occur, the air operator should re-evaluate its training program.

**D. Instilling Respect for Compliance and Safety.** The respect that management personnel have for compliance and safety can directly affect the attitudes their employees have toward compliance and safety. Some indicators of effectiveness in developing positive attitudes toward compliance and safety through a training program are the following:

- Credible, qualified, and motivated instructors
- Positive student attitude toward training

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- Achievement of satisfactory results after testing
- Professional behavior traceable to effective training
- Training presented in a timely manner (for example, training in cold weather operation before the winter months)
- Company-instilled atmosphere of reward for self-improvement and professionalism
- Volume 4, Chapter 21 contains detailed information on training programs

**4.4.1.11. MANUALS AND PROCEDURES.** The GACARs require operators to have and maintain an operations manual (OM) and maintenance manual (MM). These manuals describe the operator's methods of conducting business and assigning responsibilities to its employees. The content of the manuals may vary depending upon the operator's size and scope. The manual must have complete and detailed information for all employees to perform their duties. GACAR Parts 121, 125 and 135 contain the minimum content requirements.

**NOTE:** See Volume 4, Chapter 12, "Manuals, Procedures, and Checklists," for detailed information.

**4.4.1.13. RECORDKEEPING SYSTEMS.** Situations involving the presence of one or more of the risk indicators outlined in Paragraph 4.4.1.5 of this section usually change the capability and character of the affected operator. A transition period often follows when the original capabilities of the operator are in a state of change until new capabilities may be established and stabilized. Air operators must be on the alert for changes in operating philosophy that could cause negative changes in attitude on the part of their employees toward professionalism, compliance, and safety. Air operator management's increased surveillance of its recordkeeping may be necessary to more carefully monitor the system. In other cases, particularly if a change is made to the recordkeeping system, GACA acceptance or approval will be required, along with a more aggressive approach to the surveillance itself.

**NOTE:** Familiarity with recordkeeping requirements is important for aviation safety inspectors (Inspectors) and air operator management. Additional guidance may be found in Volume 4, Chapter 11 and Volume 12, Chapters 3, 6 and 9.

**A. Definition.** A record is an account of an occurrence or event and includes proof of the event's

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occurrence through certification by signature or other means.

**B. Errors and Omissions.** Minor errors and omissions on the part of the operator may not constitute a lack of compliance and therefore may not require enforcement action.

**C. Regulatory Requirements.** GACAR Parts 121, 125 and 135 require that operators maintain records on crew members and dispatchers participating in flight operations, as well as on aspects of aircraft flight operation and aircraft maintenance deficiency reporting.

**4.4.1.15. FLIGHT CREW SCHEDULING.** The physical and mental condition of employees is directly related to the sleep, rest, and relaxation they receive. Management personnel must employ fatigue countermeasure strategies to ensure that employees are adequately rested before they accept a flight duty assignment. Some employees, such as flight crew members, must receive a minimum amount of rest before flight. The required rest times are varied, and depend upon the particular GACAR part under which the crew member operates.

**A. Required Records.** Air operators must maintain records showing flight and rest period times for each flight crew member. There is no single method approved by the GACA to maintain these records. The operator may use any method, including computer records that clearly show the rest periods and flight duty times of each flight crew member.

**B. Flight Crew Fatigue and Stress Indicators.** There are a number of factors that affect crew functions and those factors should be addressed by air operator management. These factors that may be identified directly affect a pilot's physical, mental, and overall well-being. It may be appropriate to reduce flight duty times and/or increase rest periods based upon the effects of the following causes of fatigue and stress:

- A large volume of passengers and baggage
- Climatic conditions, such as extreme heat and humidity, cold, frost, ice, and snow
- Long workdays
- Inadequate time allowed for meals
- Unavailability of food and drink

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- Noisy working environments
- High number of instrument takeoffs, approaches, and landings
- Inordinate schedule demands and changes
- Low-experience flight crews
- Overnight accommodations not conducive to adequate rest
- Situations that compromise safety, such as insufficient rest times, exceeding MEL limits, and other operational excesses

**4.4.1.17. OPERATIONAL CONTROL.** Air operators conduct operational control by making decisions and performing those actions on a daily basis that are necessary to operate flights safely and in compliance with applicable regulations. Air operator operational control systems vary with the kind of operation the operator is authorized to conduct, the complexity of the operation, the means of communication, and the persons who are involved in preparing for and conducting flights under the operator's system.

### A. Part 121.

1) *Scheduled Operations.* Certificate holders conducting scheduled operations under Part 121 must have a dispatch release system as specified in GACAR § 121.1309 and generate dispatch releases in accordance with GACAR § 121.1509.

2) *Unscheduled Operations.* Unscheduled and special unscheduled operations under Part 121 must have:

- A flight release system as specified in GACAR § 121.1325 and generate flight releases in accordance with GACAR § 121.1509 or
- A dispatch release system in accordance with paragraph A 1) above

**B. Part 135.** GACAR § 135.585 requires the name and title of each individual authorized to exercise operational control be listed in the operator's OM. A Part 135 operator may opt to utilize a dispatcher, though it is not a requirement in GACAR § 135.429. In addition, the

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operator may delegate the authority for a specific flight to the PIC, but the operator always retains full responsibility.

### C. Operational Control Responsibilities.

- 1) *Air Operator Responsibilities.* It is the responsibility of the air operator to ensure that all functions required, such as crew scheduling, load planning, and aircraft routing are accomplished before the flight is authorized to depart. The operator must establish an internal communications system and administrative procedures that will ensure the achievement of the required functions.
- 2) *GACA Responsibilities.* It is the responsibility of the GACA to evaluate the operator's operational control system to ensure that the system complies with the applicable regulations. The system must be effective and provide for the highest level of safety in the operation being conducted. The GACA must be aware of any management problems that may lead to system breakdown. Some indicators of potential problems may be any of the following:

- Personnel not knowledgeable, competent, or proficient
- Inadequate communications systems
- Inadequate facilities
- Above-average workloads
- Poor or improper procedures
- Ineffective training
- Any of the air operator risk indicators listed in paragraph 4.4.1.5

**NOTE:** For detailed information on operational control, see Volume 4, Chapter 25.

**4.4.1.19. USE OF MEL AND CDL.** Another area in which air operator management must be especially observant, when involved in situations created by any of the indicators set forth in Paragraph 4.4.1.5, is that of Minimum Equipment List (MEL) and Configuration Deviation List (CDL) requirements and

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procedures. The presence of one or more of the risk indicators will usually change the capability and character of the affected operator. Any breakdown or degradation of MEL and CDL procedures due to management ineffectiveness, or from any other cause, could have an immediate and significant impact on flight safety.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 4. EVALUATE/AMEND AN OPERATING CERTIFICATE FOR PARTS 121, 125, AND 135**

##### **Section 2. Air Operator Mergers and Acquisition of Air Operator Operational Assets**

**4.4.2.1. GENERAL.** This section provides direction and guidance and a process to follow to General Authority of Civil Aviation (GACA) Principal Aviation Safety Inspectors (PIs) when air operators merge operations, acquire operational assets of another air operator, or change ownership. These actions generally result in operational changes requiring various levels of GACA coordination and approval or acceptance of the changes before they can be implemented. For mergers and situations involving the acquisition of operational assets of another air operator (acquisitions), the types of changes are normally characterized by the following:

- Changes in operational control systems and philosophy
- Changes in programs or subsystems which are part of the operational control system
- Revisions to manuals containing procedures for conducting various operations, maintenance, and inspection programs
- Revisions to training curricula and/or changes in employee qualification criteria for persons who will be conducting merged or new operations and/or programs

**A. Mergers and Acquisitions.** These situations may have a significant effect on GACA resources and it is imperative that they be handled efficiently and in a manner that ensures continued compliance with the General Authority of Civil Aviation Regulations (GACARs) and safe operating practices. The GACA's ability to effectively fulfill its responsibility concerning mergers or acquisitions is directly influenced by the following factors:

- 1) Complexity of the affected operations
- 2) An air operator's timely notification of the GACA
- 3) The GACA's early understanding of the changes which will result from the merger or acquisition

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4) The air operator's comprehension of the actions which must be taken to obtain GACA approval or acceptance of the consequent changes

5) The length of time available and sequence in which changes are to be implemented

**B. Notification.** The GACARs do not specifically require operators to notify the GACA of impending mergers or acquisitions. The last step of many changes resulting from mergers or acquisitions is approval and issuance of operations specifications. Early notification enables the GACA to make contingency plans and be prepared to respond in a timely manner. This benefits the affected air operators and the GACA.

**C. Transition Plans.** Situations involving mergers or acquisitions usually change the capability and character of the affected operators. A transition period often follows when the original capabilities of the affected operator will be in a state of change until new (different) capabilities may be established and stabilized. Regardless of the extent of change, the GACA has continuing responsibility for overseeing the operator's operation. These responsibilities can be more effectively managed if the GACA is fully aware of the operator's intentions during the transition period. The GACARs do not require air operators to develop and provide a plan to the GACA. However, in most situations, changes to parts of an operation such as operations specifications, training programs, maintenance programs, manuals, checklists, minimum equipment list (MELs), recordkeeping, or flight control will require GACA approval or acceptance. The controlling (surviving) operator's management personnel must be made aware that a transition plan outlining changes which require GACA approval or acceptance is necessary if the operator's schedules for obtaining appropriate approvals or acceptance are to be met. Until the controlling air operator makes these changes and obtains these approvals, it must continue to operate in accordance with current approvals. Continued safe operations can only be assured when conducted in accordance with a transition plan which provides for orderly and realistic accommodation of the changes to be made. Transition plans for conducting operations during mergers or acquisitions should include the following:

1) An outline of changes to be made during the transition period which will require GACA approval or acceptance.

2) The controlling air operator's best estimate of when it will implement changes (These estimates should be incorporated into the transition plan. However, the GACA may give the controlling air operator a Certification Job Aid and Schedule of Events, which can be found

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in the applicable air operator certification handbook chapter (Handbook Volume 3, Chapter 3 for Part 121, Volume 3, Chapter 4 for Part 125, and Volume 3, Chapter 6 for Part 135), as an example to use to record estimates of when these changes will be made.)

3) A description of the interim methods and/or procedures which will be used during the transition period to ensure compliance with the GACARs and safe operating practices until all changes are fully implemented.

4) Mergers. When two or more air operators merge operations, there will be significant and often complex changes to the capabilities and characteristics of one or more of the merging parties. Usually, all of the merging parties' operations are changed to some extent. The transition plan should address the manner in which, and when, such items as certificates, operations specifications, manuals, training programs, maintenance programs, and recordkeeping procedures will be merged. This plan should indicate a completion of all the merged items, so that at the end of the transition period, the controlling air operator's operation reflects only a single operation.

5) Acquisitions. There are three types of acquisitions:

a) Acquisitions by holding companies (non-air operators) when the air operator continues to exist as an independent entity (subsidiary), is a type of acquisition which requires little, if any, GACA action. Usually, few operational changes are made and development of a transition plan is not necessary. Inspectors should consider any possible implications to the Safety Management System (SMS) required under GACAR Part 5, including the identification of the Accountable Executive.

b) Acquisitions that change personal or corporate ownership, but do not change the capability or characteristics of the operation and do not make extensive changes in management personnel required by the GACARs, generally require a minimum of GACA action. The affected certificate, operations specifications, and manuals will need to be amended to show the new name of the air operator. A transition plan may or may not be necessary.

c) Acquisitions that involve the transfer of significant amounts of operational assets, including equipment and/or personnel, are similar to mergers. A transition plan must be developed in much the same way as a transition plan is developed for a merger.

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**4.4.2.3. THE PROCESS FOR HANDLING MERGERS AND ACQUISITIONS.** The process for handling mergers or acquisitions follows the general approval/acceptance process described in Volume 1, Chapter 4, Section 1 of this handbook. The general principles and terms used in the generic process are applicable to the process described in the following paragraphs. For this discussion, “controlling air operator” identifies key management personnel of the organization that will hold the certificate that authorizes operations after a merger or acquisition. Inspectors should caution air operators that they must carefully manage the risks imposed by mergers and acquisitions using the full capacities of their SMS as required under GACAR Part 5 and that the GACA expects the air operators to show how they intend to manage these risks during the transition. The methods used to mitigate risks should be documented in their transition plan.

### **4.4.2.5. PHASE ONE.**

**A. Notification.** Air operators involved in a merger or acquisition should, on their own initiative, notify the GACA of an impending merger or acquisition. The GACA, however, may first learn of these impending actions through news media or other means. Within five (5) working days of becoming aware of an impending acquisition or merger, principal inspectors shall contact their air operators to offer assistance in assuring continued regulatory compliance during any change. Although it may involve sensitive issues, the intent of this early contact is to establish a good working relationship that will help the air operator ensure that aviation safety is not compromised during transition. Regardless of the means of notification, the GACA must make the following initial determinations as early as possible:

- 1) Determine who the controlling air operator will be and where the principal base of operations will be located. These issues are normally resolved by the affected air operators in the early discussion stages of a merger or acquisition. The GACA should discuss these issues with their respective air operator’s management as early as possible.
- 2) Establish and maintain clear lines of communication throughout the transition period to provide an ongoing dialogue between assigned principal inspectors, the GACA, and the transitioning air operator. The GACA should fully coordinate its findings and use the results of these discussions as the basis for determining who the controlling air operator will be and where the principal base of operations will be located.
- 3) Decide which Inspectors will be assigned responsibilities as the principal inspectors for the controlling (surviving) air operator.

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**B. Meeting.** The GACA must schedule a meeting to brief the controlling air operator's key management personnel of the GACA requirements. The GACA should ensure that the timing of this meeting is appropriate for the situation. When possible, the meeting should be scheduled before a merger or acquisition is formalized so that contingency planning can be initiated by the operator and the GACA. In other situations, it may not be possible or appropriate to schedule the meeting until after the merger or acquisition has been formalized. Assigned Principal Inspectors should prepare for and conduct the briefing. The certification job aids and the schedule of events may be useful in preparing for this briefing.

- 1) The first item for discussion at the initial meeting should be verification of information provided to the GACA when notified of the impending merger or acquisition. PIs should identify any changes to the information previously provided.
- 2) The GACA shall inform the controlling air operator that it must develop a transition plan outlining proposed changes with estimates of when the changes will occur. The controlling air operator should submit this transition plan to the GACA. The PIs must brief the controlling air operator that the purpose of the plan is to:
  - a) Provide an orderly approach during the transition period for making changes necessitated by the merger or acquisition.
  - b) Provide a common basis of understanding between the air operator and the GACA of the changes to be made and when and how they will be made.
  - c) Permit the GACA to coordinate its activities with the air operator's activities so that the GACA can efficiently and promptly respond to requests for approval or acceptance of changes.
  - d) Ensure continued compliance with regulatory requirements and safe operating practices during the transition.
- 3) During the initial meeting, the controlling air operator must understand the kinds of information that should be included in the transition plan. The kind of information to be outlined is dependent on the type and complexity of the situation. PIs should request only information that they believe necessary for the situation. Figure 4.4.2.1 provides a Transition Plan Job Aid for Inspector use. The following list gives examples of the kinds of information that should be addressed when appropriate to the situation. PIs should request

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any other kinds of information not included in the following list if, in their judgment, it is necessary.

- a) The interim methods the air operator will use:
  - 1. To train crew members, dispatchers/flight followers, and ground personnel.
  - 2. To keep these personnel current and qualified.
- b) The air operator's plan to change the training or integrate training programs.
- c) The air operator's procedures for scheduling crew members and ground personnel into changed or integrated training programs.
- d) The maintenance programs and mass and balance programs the air operator will use, and any interim procedures associated with these programs.
- e) The air operator's plan to change or integrate maintenance and mass and balance programs.
- f) Any interim recordkeeping methods and/or procedures the air operator will use, to include:
  - 1. Training and qualification records.
  - 2. Flight time, duty period, and rest records.
  - 3. Trip records.
  - 4. Maintenance records.
- g) The air operator's plan to change and/or integrate recordkeeping methods and procedures.
- h) The air operator's interim procedures for using its operations and maintenance manuals, checklists, minimum equipment list / configuration deviation list, aerodrome analysis, emergency manuals and any other company manuals including planned changes and/or integration of these documents, methods which will be used to

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introduce crew members and ground personnel to changes in these documents, and any training to be given on these changed documents.

- i) The air operator should request an amendment to its operations specifications. Amendment requests should include any planned changes in authorizations, limitations, management personnel, and other areas affected by the merger as necessary. The air operator must provide a schedule of the proposed changes in order to facilitate issuance of amended operations specifications.
- j) The air operator's interim methods and/or procedures for operational control including dispatch/flight release, weather and aerodrome data, maintenance control, and control of contractual support.
- k) The air operator's plan to change the systems, methods, and procedures used for operational control.
- l) The air operator's plan for implementing any required changes to their Safety Management System.
- m) Any other changes the air operator plans to make to the kinds of operations and areas of en route operations, including planned reductions, consolidations, expansions, and/or relocations of operations, equipment, and/or facilities.

**C. Transition Plan.** Principal Inspectors shall encourage the controlling air operator to consult with and solicit advice from PIs during development of the transition plan. In certain situations, the controlling air operator may be reluctant to develop a transition plan for submission to the GACA. This reluctance could be based on concerns about the time and resources required to develop a plan, or whether the GACA will hold the operator to its proposals and schedules in an inflexible manner. In these situations, the controlling air operator shall be advised that without a transition plan, the GACA will be unable to assign a priority to GACA attention on requests for approvals of changed programs or amendments to operations specifications. The controlling air operator should also be advised that the GACA recognizes that modifications to the transition plan and estimated schedules will often be necessary; and, with appropriate notification of these changes, the GACA will be able to respond in a timely manner.

**D. Planning.** Principal Inspectors should encourage the controlling air operator to submit the transition plan to the GACA as soon as possible so that the GACA may expeditiously begin

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planning its activities.

**E. Surveillance.** Without a transition plan, continued compliance with regulatory requirements and safe operating practices can only be assured through increased surveillance. If the controlling air operator refuses to submit a transition plan, the GACA must implement a program of increased surveillance. This increased surveillance must cover all aspects of the controlling air operator's operation and the operations of other parties involved in the merger or acquisition. If the increased surveillance indicates any trends of noncompliance, PIs must request or conduct appropriate in-depth inspections as necessary to assure safe operations.

### 4.4.2.7. PHASE TWO.

A. Phase two begins when the controlling air operator submits the transition plan. Principal Inspectors must review the plan in detail during this phase. PIs should carefully consider the feasibility of the plan with respect to:

- Logical sequence of events and activities
- Continued compliance with the GACARs and safe operating practices
- Completeness of events or activities
- Inspector and other GACA resource availability

1) *Logical Sequence of Events and Activities.* Many events and activities outlined in the plan must occur before other events or activities. For example, if the controlling air operator plans on mixing flight crews previously from different air operators, certain training must be completed before mixing crews.

2) *Continued Compliance with the GACARs and Safe Operating Practices.* The plan should outline methods or procedures to be used to ensure continued compliance with the GACARs and safe operating practices. For example, previously approved MELs based on specified maintenance support procedures should continue to be used with the same specified maintenance procedures until the MEL is changed and approved. Another example would be a need for the separate airlines involved to keep separate recordkeeping systems and procedures until new methods and procedures are established and activated.

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3) *Completeness of Events or Activities.* The plan must indicate how and when an event or activity will be completed. For example, if the plan indicates that manuals will be changed, it must show that completed changes will be made to include removal of outdated material and erroneous references to non-surviving entities or activities. It should indicate the date for completion of these types of events or activities. The transition plan should not outline “open-ended” events or activities. It should indicate a completion of the transition period or when all changes resulting from the merger or acquisition are scheduled to be completed.

4) *Inspector and Other GACA Resource Availability.* During review of the transition plan, PIs should determine the availability and capability of Inspector resources and develop plans and schedules accordingly. To be responsive to the controlling air operator’s needs, PIs will need to conduct timely evaluations of the changes outlined in the transition plan.

**B.** PIs must determine whether the transition plan represents a feasible proposal. If significant deficiencies, omissions, or impractical proposals exist, the PIs should meet with the controlling air operator’s management and attempt to resolve these problem areas. If these problem areas cannot be resolved to the satisfaction of the PIs, the plan must be returned to the controlling air operator with a letter briefly describing the unsatisfactory areas. The letter should also explain that the GACA cannot accept the plan since it does not ensure continued compliance with the GACARs and safe operating practices. A copy of this letter and the transition plan must be retained by the GACA in its operator file.

**NOTE:** When a transition plan is returned because it does not ensure continued compliance, or when controlling air operators refuse to develop and submit a plan, the GACA must initiate increased surveillance of all operations conducted by the controlling air operator. The PIs should consider requesting an in-depth inspection of that air operator (appropriately timed for the situation).

**C.** If the transition plan is acceptable, PIs should inform the controlling air operator of the GACA’s acceptance, either verbally or by letter. Acceptance of the plan represents a commitment by the PIs to make reasonable efforts to accommodate the controlling air operator’s planned changes in a timely and responsive manner.

**D.** When PIs accept a Part 121 operator’s transition plan, the PIs will issue OpSpec A502, Air Operator Certificate Holder Merger. See Volume 15, Chapter 3 of this handbook, for guidance about issuing OpSpec A502.

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**4.4.2.9. PHASES THREE, FOUR, AND FIVE.** As the air operator initiates changes in accordance with the transition plan, PIs must conduct evaluations of those changes in the same manner as other phase three evaluations of changes to a normal operation. If phase four demonstrations and inspections are required, they will be planned for and conducted in the same manner as normal operations. Procedures for approval or denial of the changes outlined in the transition plan are the same as other phase five approvals or denials. PIs must closely monitor the progress of actual events or activities presented in the plan. If the sequence of events or activities is advanced or delayed, PIs must consider the effect on other events or activities.

**4.4.2.11. IN-DEPTH INSPECTION CONSIDERATIONS.** When extensive changes or integrations occur in complex mergers or acquisitions, principal inspectors should consider requesting an in-depth inspection of the controlling air operator's operation. This in-depth inspection should normally be planned towards the end, or after completion, of the transition period. The results of an in-depth inspection should indicate how effectively the transition plan was accomplished. It should also reveal any problem areas needing further attention or surveillance.

**NOTE:** Regardless of the complexity of the situation, if at any time during the transition period when continued compliance with the GACARs or safe operating practices becomes questionable, the GACA should conduct an in-depth inspection without delay.

**Figure 4.4.2.1. Merger and Acquisition Transition Plan Job Aid**

The following list illustrates the types of items Principal Inspectors should encourage the operator to include in a transition plan. Due to the variable nature of each merger or acquisition, the list is not an all-inclusive or mandatory list of items. It is designed solely to remind PIs of the need to schedule work activities in a logical and timely manner.

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GAR CODE	NAME OF AIR OPERATOR:	APPLICABLE ITEM (Y/N)	DATE RECEIVED	DATE COMPLETED
	<b>PHASE ONE</b> A. INITIAL GACA NOTIFICATION			
	B. INITIAL MEETINGS WITH AIR OPERATOR			
	C. INITIAL GACA MEETINGS AND DETERMINATIONS			
	<b>PHASE TWO</b> A. TRANSITION PLAN SUBMITTED AND REVIEWED FOR COMPLETENESS AND ACCEPTABILITY			
	<b>PHASES THREE AND FOUR</b> EVALUATION OF PLANNED ITEMS			
	A. TRAINING PROGRAMS (CATEGORIES OF TRAINING) FOR CREW MEMBERS AND DISPATCHERS			
	1. INITIAL NEW HIRE TRAINING FOR NEWLY HIRED PERSONNEL			
	2. INITIAL EQUIPMENT TRAINING			
	3. TRANSITION TRAINING			
	4. UPGRADE TRAINING			
	5. RECURRENT TRAINING			

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	6. REQUALIFICATION TRAINING			
	7. CHECK PILOT TRAINING			
	8. SECURITY TRAINING			
	9. DANGEROUS GOODS TRAINING			
	10. SMS TRAINING			
	B. TRAINING PROGRAMS FOR MAINTENANCE PERSONNEL			
	1. MECHANIC/REPAIRMAN			
	2. INSPECTION PERSONNEL/RII			
	3. GROUND HANDLING/SERVICING			
	4. STATION PERSONNEL			

NOTE: FOR MERGERS AND ACQUISITIONS, ALL CREW MEMBERS & DISPATCHERS REQUIRE INITIAL NEW-HIRE TRAINING WITH THE NEW AIR OPERATOR BEFORE ASSIGNMENT TO A DUTY POSITION. MAINTENANCE, RAMP, OPERATIONS, AND STATION PERSONNEL MAY REQUIRE TRAINING.

## REMARKS

	C. EVALUATE APPLICABLE MANUALS			
	1. COMPLETED OPERATIONS MANUAL			
	2. COMPLETED MAINTENANCE MANUAL			
	3. GACA-APPROVED AIRCRAFT FLIGHT MANUAL			
	4. COMPANY AIRCRAFT OPERATIONS MANUAL			

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	5. AIRCRAFT CHECKLISTS			
	a. Normal			
	b. Abnormal			
	c. Emergency			
	6. CABIN CREW MEMBER MANUAL			
	7. DISPATCHER/FLIGHT FOLLOWING/LOCATING			
	8. STATION OPERATIONS MANUAL			
	9. COMPANY EMERGENCY MANUAL			
	10. AERODROME DATA AND EN ROUTE MANUAL  (Charts and Plates)			
	11. AERODROME/RUNWAY ANALYSIS (Performance)			
	12. MINIMUM EQUIPMENT LIST			
	13. CONFIGURATION DEVIATION LIST			
	14. MAINTENANCE TECHNICAL MANUALS:			
	a. Airframe/Powerplant			
	b. Structural Repair			
	c. Parts Catalogue			
	d. Inspection Procedures			
	e. Manufacturer's or Vendor's Manual			
	f. Wiring Manual			

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	g. Overhaul Manual			
	15. FUELING/REFUELING/DEFUELING/DEICING			
	16. MASS AND BALANCE CONTROL PROCEDURES			
	17. DANGEROUS GOODS PROGRAM (TDG)			
	18. SECURITY PROGRAM			
	19. RELIABILITY PROGRAM			
	20. CONTINUOUS AIRWORTHINESS MAINT. PROG.			
	21. EMERGENCY PLAN/NOTIFICATION			
	22. PASSENGER BRIEFING CARDS			

REMARKS:

	D. CONTRACTS/LEASES/AGREEMENTS			
	1. TRAINING CONTRACTS			
	2. MAINTENANCE CONTRACTS/AGREEMENTS			
	3. AIRCRAFT LEASES			
	4. WEATHER/COMMUNICATION CONTRACTS			
	5. AERODROME ANALYSIS CONTRACTS			

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 4. EVALUATE/AMEND AN OPERATING CERTIFICATE FOR PARTS 121, 125, AND 135**

##### **Section 3. Major Changes in Operating Authority**

**4.4.3.1. PURPOSE.** This section contains direction and guidance for Principal Inspectors (PIs) for processing an operator's application for a major change in its operating authority. As with a merger or an acquisition, Inspectors should caution air operators that they must carefully manage the risks imposed by a major change in operating authority using the full capacities of their Safety Management Systems (SMS), as required under General Authority of Civil Aviation Regulation (GACAR) Part 5; and that the General Authority of Civil Aviation (GACA) expects the air operators to show how they intend to manage these risks during the transition to a new operating authority. The methods used to mitigate risks should be documented in their transition plan. There are three circumstances that constitute a major change in authority.

##### **A. Transition to a Different General Authority of Civil Aviation Regulations (GACAR)**

**Part.** An operator may transition from one operating rule to another. For example, an air operator conducting unscheduled or an all-cargo operation in a Cessna Caravan (Normal Category aircraft) under GACAR Part 135 transitions its entire fleet to B-737 type airplanes (Transport Category aircraft). This would require the air operator to conduct those operations under GACAR Part 121 due to the type certification category of the new fleet.

**B. Additional Operations Under a Different GACAR Part.** An operator may request to conduct additional operations that another GACAR part governs. For example, an air operator conducting all-cargo operations in a Cessna Caravan under Part 135 (unscheduled) adds a B-737 type airplane to its fleet. This would require the operator to operate the B-737 under Part 121 due to the type certification category of the new airplane.

##### **C. Additional Authority under the Same Part.**

1) *Change in Kind of Operation under the Same Part.* An operator authorized to conduct any of these types of operations may request authority under the same part to conduct operations that were not previously authorized. Examples include:

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- An air operator with airplanes applying to add rotorcraft as well
- An air operator with unscheduled authority applying for scheduled authority
- An air operator with scheduled authority applying for unscheduled authority

2) *Request From an Existing Operator to Add a New Make and Model (Type) of Aircraft of the Same Type Certificate Category to its Operations.* An operator who is authorized to fly certain make/model transport category airplanes may request authority to add an additional make, model, and/or type of transport category airplane to its fleet.

**4.4.3.3. APPLICATION AND APPROVAL PROCESS.** PIs should view an operator's application for a major change in operating authority as a partial recertification of the operator. (The full approval process is described in Volume 3, Chapter 3 (for Part 121), Volume 3, Chapter 4 (for Part 125), and Volume 3, Chapter 6 (for Part 135). The air operator manager or the PIs having responsibility for the operator will form a certification team and appoint a team leader (TL), preferably one of the PIs. The certification team should follow all the guidance contained in Volume 3, Chapters 3 and 6 (as applicable), except that the certification process should be limited to the size and scope of the requested change. The certification team should follow the guidance found in the Volume 1, Chapter 4, General Information and the Approval or Acceptance Process.

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## VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION

### CHAPTER 4. EVALUATE/AMEND AN OPERATING CERTIFICATE FOR PARTS 121, 125, AND 135

#### Section 4. Amendment, Surrender, Suspension, Revocation, and Replacement of Operating Certificates

**4.4.4.1. GENERAL.** This section contains information, direction, and guidance to be used by Principal Inspectors (PI) and other involved inspectors for accomplishing the amendment, surrender, suspension, revocation, and replacement of certificates issued to General Authority of Civil Aviation Regulation (GACAR) Part 121, 125, and 135 air operators. Additional guidance on certification is found in Volume 1, Chapter 4, General Information and the Approval or Acceptance Process.

**4.4.4.3. BACKGROUND.** Certificate actions may be initiated by either the operator or the General Authority of Civil Aviation (GACA). The basis for GACA-initiated certificate actions can, in part, be found in Kingdom of Saudi Arabia (KSA) Civil Aviation Law and in GACAR §§ 13.83, 13.85, and 13.91. These certificate actions may be administrative, remedial, or punitive and can proceed with either a full agreement between the POI and the operator or they may be contested.

**NOTE:** The term “operator” is used in this section to refer to the holder of either an air operator certificate (GACAR Parts 121 and 135) or an operating certificate (GACAR Part 125).

**A. Definitions.** Inspectors should have an understanding of the distinctions between the various certificate actions that can occur, as defined and described in this subsection.

1) *Certificate.* A certificate is a document that contains the name of the operator, a broad statement of the operator’s operating authority, and an effective date. An operator may not conduct operations without a currently valid certificate.

2) *Amendment of a Certificate.* The amendment of a certificate is a change to the information on the face of the document, usually as the result of a name change or administrative change. Certificates rarely require amendment because the details of operating authorizations are contained in the operations specifications (OpSpecs).

3) *Surrender of a Certificate.* The surrender of a certificate occurs when an operator

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voluntarily gives up operating authority.

4) *Suspension of a Certificate.* The suspension of a certificate is the temporary, involuntary removal of an operator's operating authority by the GACA using due process of law.

Suspension usually results in the restoration, revocation, or surrender of the operator's operating authority.

5) *Revocation of a Certificate.* The revocation of a certificate is the permanent, involuntary removal of an operator's operating authority by the GACA using due process of law.

6) *Replacement of a Certificate.* The replacement of a certificate is the reissuance of a new certificate to an operator when the operator's original certificate has either been lost or destroyed.

**4.4.4.5. AMENDMENT OF A CERTIFICATE.** An operator's certificate must be amended whenever there is a change in the information on the face of the document. For example, the amendment of a certificate is required when there is a change in the legal name of the owner or an administrative change.

**A. Administrative Change to a Certificate.** An administrative change to a certificate may be required because of an error in the preparation of a certificate or because a piece of information on the certificate has become outdated. When an administrative change is made to a certificate, the original certificate number and date are retained. An administrative change to a certificate does not interrupt the operator's authority to conduct operations. Some events which necessitate an administrative change to an operator's certificate are as follows:

- A change in the address of the operator's principal base of operations
- A change to correct a mistake
- A change in name of the GACA or a change in the GACARs.

**NOTE:** Doing business as (DBAs) are not placed on certificates. The addition or deletion of a DBA does, however, require an amendment to OpSpecs A01.

**B. Operator-Initiated Amendment.** In the case of a GACAR Part 121, 125, or 135 operator initiating an amendment, such as a name or ownership change, documentation is required. The

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POI must determine what these requirements are and discuss the requirement with the operator. A clear understanding at this stage of the process precludes difficulties from arising later.

- 1) GACAR § 119.45(c) requires that an operator desiring an amendment submit an application for amendment to the GACA at least 15 working days before the requested effective date. The application consists of a letter of request and any required supporting documentation.
- 2) The POI shall conduct a preliminary review of the application for completeness and general acceptability. The entire review process may be little more than a formality. In such cases, the POI may issue the certificate immediately upon completion of the review. In other cases, the full review process can require detailed analysis. When the full review cannot be completed within 10 days, the POI shall notify the operator of the estimated time that will be required. In the case of an administrative change, the POI should reissue the certificate with the original effective date, certificate number, and an added amended date.
- 3) When the operator submits incomplete documentation, the POI shall promptly inform the operator that action cannot proceed until the deficiency is corrected. Usually these deficiencies will be overcome in the normal process of events. Should the operator's proposal be unacceptable or should the operator fail to proceed, the POI shall notify the operator in writing that the proposal has been denied. The letter must include a clear statement of why the proposal has been denied.
- 4) Operators that have received a denial to an application for amendment may petition the GACA for reconsideration. The petition must be submitted in accordance with the appeal procedures prescribed in GACAR Part 13. POIs should submit an analysis of the circumstances surrounding the matter to the GACA Manager within 5 working days of the receipt of the petition.
- 5) A new certificate number is required when there is a change in ownership or operator name. After review of the application, the POI will prepare the new certificate and will document the reasons for the change in the operator's file. In most cases, the designator element of the certificate number will remain the same. The type certificate code and the numeric or alpha suffix element should be appropriately changed to form the new certificate number (See Volume 3, Chapter 1, Section 3).
- 6) For Part 121 and 135 air operators, an amended certificate shall be prepared with the new

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certificate number and a new effective date. For a Part 125 operator, the certificate will be reissued with the proper changes, will keep the original date of issuance, and will show the amended date of issuance. The amended certificate shall be exchanged for the superseded certificate.

**C. GACA-Initiated Administrative Amendment.** On rare occasion, it is necessary for the GACA to make an administrative amendment to an air operator's certificate. In this case, the POI shall contact the air operator and explain the circumstances. The POI shall prepare the amended certificate and have the air operator exchange its current certificate for the amended one. This form of certificate action is normally administrative only and is not prompted by a remedial or punitive need.

**D. Re-Examination.** A change in ownership or other significant event requires an evaluation by the POI to determine whether the air operator remains properly and adequately equipped and able to conduct safe operations. The evaluation process may or may not lead to a complete re-examination. When a substantial change in an operation occurs, the POI may find it necessary to increase surveillance of the operation or to initiate a formal re-examination of the operator under the Civil Aviation Law and under GACAR Part 13. A significant event would be a change that could affect the safety of that operation.

1) A POI should initiate an evaluation of an operator when any of the following events occur:

- A substantial change in management personnel
- A substantial change in flight crew personnel
- Signs of significant financial stress
- The addition of a new type, make, or model aircraft to the operator's fleet
- A change in the base of operations
- A change in the operations conducted (such as shifting operations from GACAR Part 135 to Part 121)
- A cessation of operations in excess of 30 days for scheduled operations

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- A cessation of operations in excess of 90 days for unscheduled (seasonal air operators may have a longer cessation of operations as a normal condition of business)

**NOTE:** If an air operator does not meet the recency of operations requirements in GACAR § 119.55, the air operator must advise the GACA at least five consecutive calendar days before resumption of that kind of operation, and must make themselves available and accessible during that period in the event the GACA decides to conduct a full inspection re-examination.

2) A POI should be aware that problems requiring a formal re-examination do not always occur immediately after a change in name or ownership occurs. When a change in name or ownership occurs, the POI shall request a letter from the air operator that contains details of the changes in operations that are planned for a period of at least 6 months. These changes will be evaluated by the POI to determine the need for a formal re-examination. The POI may find later that, in spite of an air operator's intention, other changes have occurred and a recertification may then be required.

**4.4.4.7. SURRENDER OF A CERTIFICATE.** The POI may request, but may not compel, air operators to voluntarily surrender certificates. An air operator may voluntarily surrender a certificate at any time. To do so, the air operator should send the certificate to the POI with a written request that the certificate be cancelled and a statement of why the certificate is being surrendered. The request may not be conditional. The request must be signed either by the accountable executive, the owner, an agent for service, or a court-appointed individual authorized to act for the air operator. This procedure also applies to certificates that may be lost or destroyed. The POI shall enter a brief statement of the circumstances surrounding the voluntary surrender of the certificate in the "remarks" section of the GACA Activity Report (GAR) record, or noted in the air operator's GACA office file. If the certificate has been lost or destroyed, a statement by the air operator or owner to this effect shall be included in the written request. An air operating certificate that has been surrendered should be retained operator's file by the GACA along with a copy of the air operator's OpSpecs for a period of 5 years, and then destroyed.

**A. Reinstate of Voluntarily Surrendered Air Operating Certificate.** A voluntarily surrendered air operating certificate may not be reinstated. If the air operator subsequently decides to reinstate operations, the air operator must apply and qualify for a new air operating certificate.

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**B. Surrendering an Air Operating Certificate in Lieu of an Enforcement Action.** Air operators may propose surrendering an air operating certificate in lieu of enforcement action. The POI should not agree to such an action without the concurrence of senior GACA management. Should such an agreement be reached, the air operator's letter of request must contain a statement that the air operating certificate is being surrendered on the basis that enforcement action will not be taken. When an air operating certificate is surrendered, the POI shall enter a brief statement of the circumstances surrounding the voluntary surrender of the certificate in the "Remarks" section of the GAR record, or note the action in the air operator's GACA file.

**4.4.4.9. SUSPENSION OF AN AIR OPERATING CERTIFICATE.** When an air operating certificate is suspended under GACAR Part 13, the GACA will issue the operator a letter of suspension containing instructions with which the air operator must comply. Normally this letter will be signed by the Vice President. In general, the GACA will request that the air operator's certificate be forwarded to the GACA where it will be held until the end of the suspension period. Information and guidance concerning the disposition of a suspended air operating certificate can be found in Volume 13, Compliance and Enforcement & Resolution of Identified Safety Deficiencies. When an air operating certificate has been suspended, the air operator's GACA file should be amended to reflect the suspended status.

**4.4.4.11. REVOCATION OF AN AIR OPERATING CERTIFICATE.** Air operators must forward revoked air operating certificates to the address contained in the order revoking the certificate. Additionally, the air operator's GACA file should be amended to show that the air operating certificate has been revoked and should contain a statement of the reasons for the action taken. Should revocation be appropriate, the POI should contact the air operator and request that the air operator voluntarily surrender the air operating certificate. Should the air operator refuse to surrender its air operating certificate, the POI shall proceed in accordance with the instructions in paragraph 4.4.4.15A on emergency revocation.

**4.4.4.13. REPLACEMENT OF A LOST OR DESTROYED AIR OPERATING CERTIFICATE.** A lost or destroyed air operating certificate may be replaced by the GACA using the same information that was on the original certificate. The replacement air operating certificate should have the word "DUPLICATE" annotated on the front of the certificate and the date of preparation as well as the issuance date of the original certificate. The new documents must duplicate those that were lost or destroyed. A copy of the duplicate air operating certificate should be retained in the GACA air operator file. In the case of a destroyed air operating certificate, the air operator should send any remains of the certificate to the POI with a written request that the air operating certificate be replaced

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and a statement of why the certificate is being surrendered. The air operator, or an agent for service authorized to act for the air operator, must sign the request.

**4.4.4.15. ADVERSE ACTIONS.** According to GACAR § 13.103, the GACA may find it necessary to amend, suspend, or revoke an air operating certificate without the air operator's concurrence. An adverse action of this nature should be initiated by the POI only after an unsuccessful attempt has been made to negotiate with the air operator concerning the voluntary amendment or surrendering of the air operating certificate and only with the full concurrence of GACA senior management. When an adverse action is necessary, the GACA senior management will decide whether an order should be issued for the amendment, suspension, or revocation of the air operator's certificate. The POI must prepare the enforcement package in accordance with the guidance in Volume 13, Compliance and Enforcement.

**A. Emergency Revocation.** GACAR § 13.103 provides for the air operator to have a hearing before the order that amends, suspends, or revokes the air operating certificate can take effect. Should an emergency exist, however, the order that amends, suspends, or revokes the air operating certificate may be made effective immediately.

**B. Appeals.** The air operator may appeal an order amending, suspending, or revoking its air operating certificate under the appeal procedures prescribed in GACAR Part 13.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 1. Evaluate Outsource Maintenance Arrangement for Part 121**

###### **4.5.1.1. GACA Activity Report (GAR).**

- A. 3304 (AW) (Evaluate Arrangement)
- B. 3339 (AW) (Evaluate Contractor's Facility)

**4.5.1.3. OBJECTIVE.** This section provides information for the aviation safety inspector (Inspector) for verifying the adequacy of the contract outsource maintenance programs including the required oversight by the operator of the performance of maintenance and required inspection program contracted to others.

**4.5.1.5. GENERAL.** Operators must ensure that contract maintenance providers are complying with their Continuous Airworthiness Maintenance Program (CAMP) and other provided instructions when maintaining the aircraft, airframes, engines, propellers, appliances, emergency equipment, and components thereof and ensure that they are in accordance with the documented policies, procedures, and instructions in the operator's manual and the applicable General Authority of Civil Aviation Regulations (GACAR).

**4.5.1.7. EXPLANATION OF TERMS AND DEFINITIONS.** Outsource maintenance, outsource contract maintenance, outsource maintenance provider (OMP), and essential maintenance are used to describe the same processes used by operators for the performance of maintenance by other persons.

**A. Operator Maintenance Provider.** The term “operator maintenance provider” or “maintenance provider” is used for any person with whom the operator has made arrangements for the accomplishment of any of their maintenance, preventive maintenance, or alterations.

**B. Contract Maintenance.** The term “contract maintenance” means any maintenance, preventive maintenance, or alterations accomplished by an operator maintenance provider. However, the operator always retains primary responsibility for any contract maintenance accomplished by an operator maintenance provider.

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### C. Maintenance Definitions.

- 1) Many non-regulatory words and terms are used in the aviation industry to describe a person who performs maintenance, preventive maintenance, and alterations for an operator under the provisions of GACAR § 121.663(a), such as outsource, contract, emergency, vendor, and on call. It is important that the Inspector understand and use these words appropriately to prevent unintended changes to the regulatory meaning of the word maintenance. Other persons who perform maintenance for an operator under the provisions of GACAR § 121.663(a) can be a certificated repair station, a non-certificated organization or company, or a certificated mechanic at an aerodrome. Other persons can perform maintenance in locations such as in a hangar, on the line, or in a shop.
- 2) Regardless of who performs maintenance for GACAR Part 121 operators and the word used to describe the person, location, and facilities used by another person, all maintenance must be performed in accordance with GACAR Part 121, the operator's CAMP, and the operator's manual. There should be no differences between maintenance performed by the operator and maintenance performed for the operator by another person.

### D. Essential Maintenance.

Continuous improvement, maturity, and evolution have made it necessary for the GACA to update its contract maintenance surveillance, oversight, and terminology. This section will provide insight into the essential maintenance program.

- 1) The Essential Maintenance Provider (EMP) is any person who is used by the operator to accomplish designated Required Inspection Items (RII).

**NOTE:** Essential maintenance is for the RII of on-wing maintenance. On-wing maintenance is to mean the entire aircraft.

- 2) Splitting an engine case is not essential maintenance unless the operator has designated that item of maintenance as an item that must be inspected (requiring inspection) when the engine is still installed on the airplane only.
- 3) Essential maintenance encompasses any on-wing RII accomplished after any maintenance or alteration. Essential maintenance is maintenance that, if done improperly or if improper parts or materials were used, would result in a failure effect that would endanger the continued safe flight and landing of the aircraft. Essential maintenance is the accomplishment of the operator-designated on-wing inspection item. Essential maintenance

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does not encompass any off-wing maintenance. It is understood that this statement may be redundant. However, in this section it is most important that all inspectors and operators use this as the explanation and definition of essential maintenance.

4) The terms “other persons” and “operator” are used in this section wherever appropriate because they are consistent with the regulatory language used in GACAR Part 121. The intended meaning of the word “person” is, as stated in GACAR Part 1, an individual, firm, partnership, corporation, company, association, joint-stock association, or governmental entity.

### **4.5.1.9 CONTRACT REQUIREMENTS.**

**A. Operator Maintenance Responsibility.** Throughout the process of evaluating the contracting of maintenance, it is important to remember that the operator has the responsibility for the performance and quality of the maintenance (GACAR § 121.659). The operator cannot delegate this responsibility. The maintenance provider’s organization becomes, in effect, an extension of the operator’s maintenance organization. The operator must have the responsibility and the authority to decide what to do, when to do it, and how to do it.

**B. Performance of Maintenance.** GACAR § 121.679(a) require that all maintenance, preventive maintenance, or alterations performed by other persons be performed in accordance with the operator’s manual. Operators detail in their manuals the policies, procedures, instructions, and methods for all maintenance personnel to follow to ensure the airworthiness of its aircraft, airframe, engines, propellers, appliances, emergency equipment, and parts thereof. Since the regulations only require a maintenance provider to comply with the portions of the operator’s manual that pertain to the performance of maintenance, it is not expected for every contract provider to comply with every aspect of an operator’s CAMP. The operator must therefore have detailed policies and procedures in its manual and must provide instructions that describe exactly how the maintenance providers will perform maintenance.

**C. Maintenance Scope.** The performance of maintenance language includes all facets of performing maintenance on operator’s aircraft or components thereof and includes, but is not necessarily limited to, the following areas of the operator CAMP:

- 1) Maintenance personnel training (including inspection personnel and RII-authorized personnel);

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- 2) Instructions for the accomplishment of maintenance and inspections (including the use of maintenance manuals, work cards, engineering orders, etc.);
- 3) Duty time;
- 4) Maintenance documentation and that documentation's control (including documenting scheduled and non-routine maintenance and the use of documents to control work packages);
- 5) Maintenance records (including record retention and the transfer of maintenance records);
- 6) Parts handling, storage, and identification (including receiving, inspection, and the use of parts tags); and
- 7) Calibrated tools and test equipment.

**D. Maintenance Procedures.** These procedures must cover all aspects of contract maintenance, from contracting heavy maintenance visits to component repair to on-call line maintenance. The operator must establish in their manual the policies and procedures to administer, control, direct, and ensure the proper performance of the work conducted by maintenance providers. The operator must specifically explain how the contract provider will be provided the appropriate instructions for the accomplishment of the maintenance and must document the methods for identifying and disseminating those portions of the operator's manual that a maintenance provider must follow. It is only when the operator has implemented these requirements that the regulatory requirements can be satisfied.

**E. Essential Maintenance Provider (EMP) and other Contract Maintenance Providers Listing within the Operator's Maintenance Manual .** An operator must keep and maintain the EMP's and other contract maintenance providers' listings within their maintenance manual. The listing, as stated in GACAR Part 121, Appendix G, II, clearly requires an operator to keep a list of other persons with whom the operator has made arrangements for the performance of maintenance, etc., in their manual. Each EMP contractor listing must contain the RII that only an approved EMP is authorized to accomplish.

**F. Hired Persons.** Mechanics hired by the operator as an employee do not qualify as a maintenance provider and will not be listed. When an individual is hired as a contract maintenance provider, he is not to be considered an EMP when they are given RII authority. In

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addition, an individual must be listed when:

- 1) They are hired for labor only and are trained, qualified, and authorized in accordance with the airline's procedures.
- 2) The airline provides the facilities, parts, tools, equipment, manuals, and other necessary elements, as required by the airline's manual.
- 3) They get the required audits, as documented in the operator's Continuing Analysis and Surveillance System (CASS).
- 4) An individual who provides his services as an on call mechanic or who is hired as a contract flight mechanic must be listed in the listing, as required by GACAR Part 121, Appendix G, II.

**G. Organization Extension.** When an operator uses another person to perform maintenance, preventive maintenance, and/or alterations for them, that person becomes an extension of the operator's organization. This

**H. Work Categories.** The maintenance provider work description categories are very broad. The following are the five categories for classifying work. Keep in mind that the operator is responsible for classifying its work into these categories, not GACA.

*1) Aircraft Maintenance:*

- a) Heavy Maintenance. An example could be the inspection and repair of the aircraft airframe, performed at specified time intervals. These intervals are based upon the guidelines from the manufacturer or the CAA of the State of Design and they are further refined by the airline or operator. Scheduled inspections are typically based on a fixed number of flight hours. There are four levels of inspection for commercial jet aircraft, usually termed "A," "B," "C," and "D" checks. A and B checks are normally considered to be a part of line maintenance. C and D checks are classified as heavy maintenance. At the present time, there are a variety of approaches to heavy maintenance.

**NOTE:** To minimize aircraft downtime and to improve labor efficiency, airlines typically undertake these checks in a series of progressive inspections. D-check tasks are often

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divided up and included in the more frequent C-level inspections. Thus, an aircraft might receive a C1, C2, C3, and C4 check in sequence over many years, eliminating the need for a full D check. See Table 4.5.1.1.A below.

**Table 4.5.1.1.A. Example, Airframe Heavy Maintenance Overview**

Market	Activity	Description	Frequency	Estimated Time
Air Transport	C Checks	A detailed inspection of the airframe, components, and accessories; some access panels are removed. Typically includes a portion of any applicable corrosion prevention programs.	2,500 to 3,000 flight hours.	72 hours (airlines with small fleets may require 7+ days).
	D Checks	A comprehensive structural inspection and overhaul of the aircraft, intending to return it to its original condition (to the extent possible); interiors and most components are removed.	20,000 to 24,000 flight hours (approximately 5 to 8 years).	30 days.

**NOTE:** This table is not meant to be all inclusive of heavy maintenance or inspection program details.

b) Line Maintenance. Line maintenance includes light, regular checks to ensure that the aircraft is fit for flight. Line maintenance also includes troubleshooting, defect rectification, and component replacement. Mechanics diagnose and correct issues on the aircraft and carry out these checks on an ad-hoc basis or at a scheduled interval. Line maintenance consists of three primary activity categories: transit checks, daily and weekly checks, and A checks. Historically, line maintenance included B checks, which now rarely exist in current maintenance programs.

**Table 4.5.1.1.B. Example, Line Maintenance Overview**

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Activity	Description	Frequency	Estimated Time
Transit Checks	<p>Sometimes described as turn-around checks.</p> <p>Consist of specific visual checks (“walk-around”), review of check log and defects, and, where needed, defect rectification and troubleshooting.</p> <p>For long-haul operations, it will include tasks for twin-engine operation (Extended Operations (ETOPS)) clearance.</p>	Every flight cycle.	1-4 labor hours.
Daily and Weekly Checks	<p>Sometimes described as overnight checks.</p> <p>Also include 7 or 8 day checks and 3 or 4 day checks.</p> <p>Routine work as well as tasks specified by the maintenance planners; e.g., defect rectification, out-of-phase checks.</p> <p>Increasingly, it is also used for In-Flight Entertainment (IFE) and cabin maintenance.</p>	<p>Every 24 to 36 hours (occasionally 48 hours).</p> <p>Every 4 to 8 days.</p>	<p>Daily: 5-10 labor hours.</p> <p>Weekly: 10-30 labor hours.</p>

**Table 4.5.1.1.C. Example, Line Maintenance Overview**

A Checks	<p>Usually conducted at a few main bases within the airline network.</p> <p>Routine work as well as tasks specified by the maintenance planners; e.g., defect rectification, out-of-phase checks.</p> <p>Increasingly, this downtime is also used for IFE and cabin maintenance.</p>	<p>Regional: 350-450 flight hours.</p> <p>Narrow body and wide body: 500-700 flight hours.</p>	<p>Regional: 50-100 labor hours.</p> <p>Narrow body and wide body: 100-250 labor hours.</p>
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**NOTE:** This table is not meant to be all-inclusive of all line maintenance.

1) *Aircraft Engines.* Includes off-airplane maintenance of aircraft engines.

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- 2) *Components.* Includes off airplane maintenance of individual components.
- 3) *Specialized Service.* Includes services such as x-ray, plating, eddy current, painting, shot peening, plasma spray, composite structures maintenance, weighing, welding, etc.

**I. Unexpected Requirement for Unscheduled Maintenance.** Unscheduled maintenance may occur at any time. If a requirement for unscheduled maintenance occurs as a result of one cause or another, the GACA expects each certificated operator to have demonstrated that it has competent personnel and adequate facilities and equipment (including spare parts, supplies, and materials) available to address instances of unscheduled maintenance at a diversion aerodrome. A diversion aerodrome, (or aerodromes), is required to be identified in each operator flight plan.

**J. Manual Review.** Operator principal inspectors (PIs) should continually review and verify the sections or chapters of the operator's maintenance manual dealing with the contracting of maintenance to ensure that it is continually updated to reflect changes in its system operations and routing. This section must provide ready reference for contractors and company personnel with an easily controllable and convenient section of its manual in order to meet the requirements of GACAR § 145.83.

**K. Qualifications.** The operator must ensure that the organization or person used as a contract provider has:

- 1) The capability to do the work;
- 2) An organization structured to do the work;
- 3) Competent, trained personnel to do the work;
- 4) Relevant and current technical and administrative material from the operator's manual for the work;
- 5) Adequate facilities and equipment to do the work;
- 6) The ability to transfer and receive data and information necessary to support the operator's CASS; and
- 7) A current listing of individuals trained, qualified, and authorized by the operator to

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conduct required inspections. The list must identify these individuals by name, occupational title, and the inspection(s) they are authorized to perform.

**L. Subcontracted Maintenance.** The operator's maintenance manuas must also address contracted maintenance that is subcontracted to one repair station and then subcontracted out again to other repair stations and non-certificated entities. Operators that solely rely on the repair stations to oversee the subcontracted work without involvement are doing so contrary to the regulations (GACAR §§ 121.659 and 121.679(a)). Operators are responsible for all maintenance to their aircraft. They must be aware of any third party and levels below that are accomplishing maintenance to their aircraft. All contractors must be provided instructions and directions for the performance of that maintenance. This also includes the subcontracting of labor that supplements the contract provider's labor.

**M. Maintenance Program Performance Procedures.** Due to the wide variety and different levels of contracting out maintenance, the operator may evaluate and accept into its CAMP the procedures used by the contractor for the performance of maintenance. However, the operator's CAMP must contain the manner used to evaluate, accept, and authorize the contract provider's procedures.

**NOTE:** The provisions set forth for the contract maintenance provider guidance and the subsequent issuance of operations specification (OpSpec) D91, Arrangements with Maintenance Provider, are applicable to GACAR Part 121 operators only.

1) *Operator Contracts for an All-Encompassing Maintenance Program.* These situations allow for an operator to contract with another equivalent operator for the purposes of the performance of maintenance (including required inspections). In this category, all maintenance is performed in accordance with the contractor's programs, methods, procedures, and standards. The operator's aircraft is considered part of the contractor's fleet for purposes of maintenance program content and maintenance intervals, including reliability control. However, this does not alleviate the operator of its ultimate responsibility for the maintenance performed on its aircraft. The issuance of the OpSpec will authorize this type of contractual arrangement (see the applicable guidance found in Volume 15 of this handbook).

2) *Operator Participates in Parts Leasing or Exchanging Pool.* Because the operator is responsible for the airworthiness of its aircraft and the performance of its maintenance,

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contract arrangements with persons or organizations that supply parts and components other than new on a lease or exchange basis must also be considered contract maintenance providers. Leases or exchanges that do not allow the operator to be in control of the maintenance of the leased or exchanged part or component while it is in a maintenance status are contrary to the regulations, as they circumvent the responsibility for the performance of maintenance.

3) *Part Transactions.* Sending a component to a supplier and having it replaced with a new or repaired part. There are two types of transactions and both require a look at the contractual agreement between the person providing the part and the operator, looking at the bill of work that the operator sends along with the part to the person supplying the part, or both. On one hand, the transaction could be a sales receipt transaction where the operator sells its part to a parts broker and the operator buys the serviceable part from the contracted maintenance provider. This is basic buying and selling (a sales transaction) and the end product does not involve maintenance since the operator is buying the part and not sending it out for maintenance. The cost to the operator is the cost of the part; i.e., list or retail price for the part. These transactions involve persons who are not authorized to accomplish maintenance on the part. On the other hand, however, if the operator sends a part out for maintenance to a maintenance provider authorized to accomplish maintenance on the part, and the maintenance provider simply exchanges the received part for a serviceable one it had on the shelf, it is a maintenance transaction and not a sales transaction. The cost to the operator is the cost of the maintenance and not the cost of the part itself. This is a maintenance transaction.

a) In the first instance, the parts broker would not be listed on the maintenance provider list. The surveillance focus would be on the operator receiving inspection and bridging the part into the operator system.

b) In the second instance, the maintenance provider would be listed on the maintenance provider list. The surveillance focus would be on the operator maintenance provider process for handling and repairing the part according to the operator program and should be treated as any other maintenance provider that does maintenance, preventive maintenance, or alterations for the operator.

4) *Required Inspection Regulations.* This is only a partial listing of applicable regulations for required inspections.

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- a) GACAR § 121.675(b). Other persons performing required inspections must have an adequate organization to perform the inspection.
- b) GACAR Part 121, Appendix G, II. The operator must list in its maintenance manual other persons with whom it has arranged for the performance of required inspections, including a general description of that work. This listing should be in a standardized format to align with OpSpec D91. The listing should:
  1. Outline five general descriptions of work.
  2. Contain the name and location of each maintenance provider.
  3. Identify the maintenance providers who are authorized to accomplish essential maintenance.
  4. Include the specific RII that each EMP is authorized to accomplish.

**N. CASS.** Per GACAR § 121.691, the operator must maintain a system for the Continuing Analysis and Surveillance (CASS) of the performance and effectiveness of its outsourced maintenance, and provide corrective actions for any discrepancies found. As part of its CASS, the operator should establish a schedule for accomplishing continuing audits or inspections, designed to determine the maintenance provider's level of compliance with the specific work instruction and the procedures in the operator's manual. A number of variables will dictate the frequency of these audits or inspections, such as the operator's level of confidence in the maintenance provider, the complexity and quantity of the work, the quality of the work produced, and the quality of the records and certifications produced. Because of these variables, operators will have audit schedules that differ from one another. Each operator should have an audit schedule based on its own unique set of circumstances and needs.

**O. Coordinating Agencies for Supplier's Evaluation (C.A.S.E.)**. C.A.S.E. functions as a contract auditor for its members. Qualifying C.A.S.E. audits for an EMP audit can be used for operator follow up audits on EMPs, provided the C.A.S.E. audit has been accomplished within the previous 6 months and if the C.A.S.E 1A audit checklist includes the airline-specific requirements. A C.A.S.E audit may not be used as an initial audit for newly proposed EMPs.

- 1) The GACA is charged with the safety oversight of operators, including all other persons, certificated or not, used by the operator to perform maintenance, preventive, and alterations.

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There should be no differences in the GACA's oversight of a certificated maintenance provider and one that is not certificated. Aircraft maintenance, no matter who performs it or where it is performed, requires effective oversight.

2) In any case, the C.A.S.E. audit alone does not satisfy regulatory requirements. Data collected by the C.A.S.E. audit must be analyzed to determine that the operator's programs are working effectively and that any deficiencies are corrected. The C.A.S.E. program must be integral to the operator's CASS.

**P. Airworthiness Release or Aircraft Log Entry Required by GACAR § 121.1545.** For the purposes of contract maintenance, it is important to note that GACAR § 121.1545(b) outlines specific requirements for the persons authorized to sign an airworthiness release or aircraft log entry. Such a release or aircraft log entry is limited to the work the repair station is rated to perform and actually performs on an aircraft for operators operating under GACAR Part 121. However, in preparing the airworthiness release or aircraft log entry, the person or, the certificated GACAR Part 145 repair station, must comply with the procedures set forth in the Part 121 operators' manual for preparing the airworthiness release or aircraft log entry. The "operator" refers not to the repair station, but to the GACAR Part 121 operator for whom the repair station is performing maintenance. This provision corresponds to the GACAR Part 121 operator's duty under GACAR § 121.679 to ensure that not only are competent personnel performing maintenance on their fleets, but that each aircraft released to service is airworthy.

### **4.5.1.11. PREREQUISITES AND COORDINATION REQUIREMENTS.**

**A. Prerequisites.** Previous experience with GACAR Part 121 operators.

**B. Coordination.** This task requires coordination with the Principal maintenance Inspector (PMI) and may also require coordination with the Director of Airworthiness.

### **4.5.1.13. REFERENCES, FORMS, AND JOB AIDS.**

**A. References:**

- GACAR Parts 43, 91, 119, 121
- Advisory Circular (AC) 120-16, Operator Maintenance Programs.

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- AC 120-79, Developing and Implementing an Operator Continuing Analysis and Surveillance System.
- Operator, contractor, or manufacturer's manuals

### **B. Forms.**

- GACA Activity Report (GAR)

### **C. Job Aids:** None.

#### **4.5.1.15. PROCEDURES.**

**A. Audits.** The operator must conduct an onsite audit of each EMP and contract provider on the operator contract maintenance provider listing. The operator must have a method to determine if the maintenance provider has the capability to do the requested work. An operator's CASS needs to address both internal and external audits. The operator must have procedures for its auditing process, including the scheduling of audits. Audits are intended to ensure that inspection and maintenance personnel, and outside maintenance providers, comply with the operator's manual, program, and all applicable requirements. The audit may be onsite or by some means other than an onsite audit.

**B. Audit Accomplishment.** Each operator must accomplish an onsite audit in accordance with its contract maintenance provider or EMP qualification process before it places that maintenance provider on the listing. The regulatory requirements are GACAR §§ 121.679, and 121.691. GACAR § 121.691 does not have a specific requirement to accomplish audits; it does have an operator requirement to demonstrate that their maintenance providers comply with GACAR § 121.679 and all of the RII requirements. Further guidance for the operator can be found in FAA AC 120-79. The operator's contract maintenance provider or EMP audit should take into account all of the applicable regulations of GACAR Part 121 that apply to a maintenance provider through GACAR §§ 121.1, 121.675, 121.679(a), and all of those regulations related to Required Inspection Items (RII).

**NOTE:** Essential maintenance encompasses any RII accomplished on-wing after any maintenance or alteration. Essential maintenance is maintenance that if done improperly or if improper parts or materials were used, would result in a failure effect that would endanger the continued safe flight and landing of the airplane. Essential maintenance is the

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accomplishment of the operator-designated inspection item on-wing. Essential maintenance does not encompass any off wing maintenance.

**NOTE:** The GACA's EMP onsite audits are required to be accomplished on a scheduled basis. It is recommended that the EMP follow up surveillance be conducted at intervals not to exceed 3 calendar-years. If an EMP has not performed maintenance work for the operator since the provider list was last revised, that EMP would still have a requirement to be inspected by the GACA.

**C. Surveillance.** Inspectors with surveillance responsibilities for operators should review the operator's maintenance program to determine whether the operator's procedures adequately address all aspects of contract maintenance. These policies and procedures should be easily recognizable, identified, and defined.

**D. CAMP Compliance.** Under GACAR § 121.679, the operator's CAMP must ensure that the contract maintenance provider will perform work in accordance with the operator's program. The information necessary to ensure compliance with the operator's CAMP must be made available to the contract maintenance provider before the work begins. The operator must ensure that the contract maintenance provider follows the contract information supplied.

**E. Airworthiness Determination.** Further, the operator must be able to show that the contract maintenance provider has competent personnel, adequate equipment, and facilities. By showing that all of the above requirements are complied with, the operator is able to ensure that its aircraft are properly released to service in an airworthy condition under the operator's specific CAMP.

1) Under GACAR § 121.683, the operator's maintenance manual must cover the administration of its CAMP, as written in its manual. The manual must include specific methods for complying with the applicable sections of GACAR Part 121 when maintenance providers perform maintenance, preventative maintenance, and alterations on behalf of the operator. These sections also require the operator to list in its manual the persons with whom it contracts for maintenance and RII, and to include a description of the contracted work.

2) The following specific areas must be addressed in the operator's CAMP.

a) Under GACAR § 121.675, the operator must ensure that the person with whom it arranges to perform maintenance has an organization adequately capable of handling the

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work. The operator must evaluate the minimum organizational requirements that a contract maintenance provider must meet for a particular job. The operator must ensure that the contract maintenance provider is capable of performing its CAMP requirements as provided by or as authorized by the operator for the type of work being contracted.

b) Furthermore, if the RII are to be accomplished by the contract maintenance provider, the inspection functions within the contracting organization must be separate from the production organization. If the operator's maintenance program or procedures require specific compliance aspects, the operator must be able to show that the contract maintenance provider is equally capable of following its manual procedures, written instructions, and any work scope provided.

### F. Required Inspection Personnel.

1) Under GACAR § 121.687, the operator must ensure that the maintenance provider performing the work knows that it is specified RII. The operator must also ensure that the maintenance provider RII-authorized personnel are trained in accordance with the requirements of the operator's CAMP.

2) Each operator shall maintain or determine that each person with whom it arranges to perform its required inspections maintains a current listing of persons who have been trained, qualified, and authorized by the operator to conduct required inspections. The persons must be identified by name, occupational title, and the inspection that they are authorized to perform. The operator shall give written information to each person so authorized by the operator, describing the extent of the person's responsibilities, authorities, and inspection limitations. The operator must provide this list for inspection upon the GACA's request.

3) The operator's audit used to survey contract maintenance providers or EMPs shall include a specific review of RII qualifications and records of the individual RII-designated personnel.

4) RII qualification requirements apply to both the entity, if there is one, as well as the individual who actually carries out the required inspection. Essential maintenance is anyone who is used by the operator to accomplish the inspection that the operator has designated as an on-wing RII. It does not include the actual maintenance that requires the RII.

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**G. RII EMP Authorization for a One-Time Only Event.** A Required Inspection Item (RII) relates directly to flight safety and, as such, a one-time RII EMP authorization must be accomplished under exactly the same process as an authorization for a continuing use. The one-time authorization is exactly that. If an operator makes an authorization due to unscheduled RII requirements, it should have in its manual a process to identify repetitive usage of the same person.

- 1) In addition to any OpSpec D91 requirements, the Inspector should verify that the operator's RII qualification and authorization process, including a "one-time RII authorization," demonstrates compliance with at least all of the regulatory requirements of GACAR § 121.687, as stated below.
  - a) The RII candidate is properly trained and qualified for the RII (GACAR § 121.687(a)). A GACA mechanic's certificate with airframe ratings, powerplant ratings, or both, by itself, does not demonstrate that an individual is properly trained and qualified to accomplish RII work.
  - b) The RII candidate is covered by a training program that ensures that the RII candidate is fully informed about RII procedures and techniques and new equipment in use, and is competent to perform RII duties (GACAR § 121.695).
  - c) The RII inspector will be under the supervision and control of the inspection unit at all times when performing RII duties. When the required inspection is underway, maintenance control may not be involved in the required inspection (GACAR § 121.687(b)).
  - d) The RII inspector is provided with the appropriate parts of the operator manual that he is required to comply with (GACAR § 121.151).
  - e) When the operator authorizes an RII inspector, the operator provides that individual with written information describing the extent of their RII responsibilities, authorities, and limitations (GACAR § 121.687(d)).
- 2) The operator's process for a "one-time" authorization may not require an onsite audit to be accomplished before using the RII EMP. However, the process must meet all of the regulatory requirements for authorizing a person to accomplish the required inspection. The

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operator should have a process in its manual that identifies how it meets all of the regulations for this “one-time” authorization, which may be different than what would be done for a full-time RII.

3) The one time RII authorization must be accomplished under exactly the same process used to qualify the operator’s own employees. The operator should use the process that it has adopted and documented in its manual for one time RII authorization.

**4.5.1.17. CASS.** Under GACAR § 121.91, the operator must continually survey its CAMP and all persons acting under that program to ensure continuous compliance with its CAMP and the regulations. The operator must have a system in place that detects, identifies, and provides timely corrective action, on a continuing basis, for all deficiencies or deviations in those portions of the CAMP accomplished by the contract maintenance provider, including maintenance recordkeeping. This generally requires the operator to perform audits of all of its maintenance providers.

**A. Maintenance Performance Quality.** The operator must have a system in place that tracks and evaluates, on a continuing basis, the standards of performance (quality) of the maintenance work accomplished by the individual maintenance provider. This must include provisions for timely corrective action if the quality of work becomes unsatisfactory and deficiencies are noted.

1) *CASS Audits.* The operator’s CASS audits must be very specific in nature. This will ensure compliance with its program. Audits performed by operators that simply evaluate whether the contract maintenance provider complies with GACAR Part 145 are not sufficient. The operator must have an “audit system that will follow the maintenance through its cycle to ensure that the maintenance provider complies with the operator’s CAMP.

2) *Third Party Evaluation.* Operators will not normally perform audits of third party organizations with which certificated repair facilities subcontract. However, the operator must have a process that determines if the third party contract maintenance provider has the organizational structure, competent and trained personnel, adequate facilities, and equipment to perform the intended functions. This process must ensure that the operator maintains its responsibility by being in control of its maintenance, regardless of who performs it.

a) *Training Programs.* Under GACAR § 121.695 the Principal Inspectors (PIs) must verify that the training program is designed to ensure that each person who determines

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the adequacy of work is fully informed about procedures, techniques, and new equipment in use, and that he is deemed competent to perform his duties. This applies to any person employed by any company that performs maintenance for an operator. The operator must detail in its CAMP how it will comply with these regulations for all contract maintenance personnel. The operator can evaluate and accept the training programs of the maintenance provider if it has determined that the maintenance provider's program meets the intent of GACAR § 121.375. This process must be described in detail in the operator's CAMP.

- b) Duty Time. Under GACAR § 121.1033 the operator must ensure that their contract maintenance providers in the KSA follow the duty time requirements. If the operator's CAMP indicates that the maintenance provider provides specific assurances, the contractor must provide those assurances. The operator must ensure that the maintenance provider has procedures in place to ensure that those assurances are being met.
- c) Certificate Requirements. Under GACAR § 121.655 the operator must ensure that only appropriately certificated persons are directly in charge of maintenance and/or perform required inspections, unless the work is performed by a certificated repair station that is located outside the Kingdom of Saudi Arabia (KSA).
- d) Authority to Perform. Under GACAR § 121.663, the operator is authorized to perform or arrange for the performance of maintenance on its own aircraft as set forth in the operator's CAMP. The center of the relationship between operators and contracted maintenance providers are the procedures and assurances set forth in the operator's CAMP. The ASI should continually ensure that the operator is able to establish compliance with its own procedures, either through direct supervision, surveillance, auditing or any combination; or through appropriate controls such as contractual relationships.
- e) Records. Under GACAR § 43.11, § 91.457, and § 121.699, aircraft owners and operators must maintain specific records. If the operator's CAMP indicates that the responsibility of making regulatory records available may be delegated to maintenance providers, the operator should clearly define the records to be maintained, the length of time the records should be kept, and the form and manner of maintaining those records. (See GACAR § 119.107(b)(1)(ii).) This must also include where the records will be

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physically located and how the information will be included in the operator's CASS.

### **B. Other Areas of Consideration.**

- 1) The operator must ensure that all repairs and alterations accomplished by its maintenance contractors are performed in accordance with approved data and in accordance with the operator's procedures in the CAMP.
- 2) The operator must ensure that all organizations with whom it arranges will adequately and promptly report to the operator per the requirements of GACAR §§ 121.1553 and 121.1557.
- 3) The operator must update the list required by GACAR Part 121, Appendix G, II.
- 4) Operators who participate in parts leasing or exchange pools must have policies and procedures in place to ensure that the regulatory responsibility for the performance of maintenance and CASS are met. Data produced by these parts or components must be analyzed to determine that the operator's programs are working effectively as intended and that any deficiencies are corrected.
- 5) An operator that elects to obtain the services of a contract maintenance provider on either an unscheduled or short notice basis must include specific procedures for doing so in its manual.

### **C. Communication Between the Operator and its Contract Maintenance Providers and EMPs.**

A contractor and an EMP are placed on the operator's provider list once the contract agreement is signed and the operator performs the required audit. Once that is accomplished, the operator is obligated to advise the contractor of that status. A operator communicates the capabilities for their contract maintenance providers or EMPs in the manner outlined in their manual (GACAR § 121.151).

- 1) All necessary policies and procedures must be included in the operator's manual in order for the operator to determine that all subcontracted work performed is accomplished in accordance with the CAMP. This includes subcontracted labor at the operator's facility or at a contract maintenance facility.
- 2) All necessary policies and procedures to transfer and receive data and information

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necessary to support the CAS program, reliability program, or other programs from which the operator has interfaces with the contract maintenance provider.

### **D. Evaluating and Accepting the Procedures or Methods of a Maintenance Provider as Part of the Operator's CAMP .**

- 1) Instead of an operator reiterating the maintenance requirements or publications that are already contained in a contract provider's manual, the operator may evaluate and accept the provider's manual, in part or as a whole, as part of its CAMP. This evaluation should include the key elements of the performance of maintenance as described in Paragraph 4.5.1.5
  - a) For example, an operator's calibrated tool interval for recalibration is 12 months and a review of the contract maintenance provider's manual shows that their requirement is 18 months. In this situation, the operator can evaluate the calibrated tool program of the provider and accept the 18 month interval or the operator can instruct the provider that the calibrated tools used on their aircraft must be calibrated within the last 12 months.
  - b) Another example is maintenance documentation. The operator's program will require all maintenance discrepancies to be documented on its specific company forms. An operator can evaluate the maintenance forms used by the maintenance provider and determine that their methods of documenting maintenance are acceptable and allow the maintenance provider to use their forms instead of the operator's.
- 2) In either case, it is important to note that this evaluation is not necessarily a comparison of the contract provider's manuals to the operator's manuals to determine that the programs are the same, but rather an evaluation of the maintenance provider's manual to determine if their program is acceptable to the operator for the accomplishment of the particular maintenance. Once this evaluation has taken place, the operator will detail to the maintenance provider how the maintenance needs to be accomplished. It should also include the method for disseminating the authorization and specific work instructions to the maintenance provider. This evaluation process and subsequent dissemination to the contract provider should be described within the operator's contract maintenance program portion of its CAMP. Instead of the operator revising its CAMP each time this process takes place, the operator can place the specific work instructions to the maintenance provider in the contract or in a letter. This process, as a whole, complies with the requirements to perform maintenance in accordance with the operator's manuals per GACAR §§ 121.659(b),

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121.679(a), and 121.663(a).

3) Operators should differentiate these policies and procedures between the different levels of contract maintenance, EMPs versus non-EMPs or providers of on-aircraft work versus a repair station that repairs components. Once the operator and the contract provider enter into an agreement in which the operator will accept the contract maintenance provider's procedures, those procedures are now part of the operator's CAMP. Any revision to the accepted procedures by the contract provider in effect revises the operator's CAMP. Policies and procedures must be contained in the operator's CAMP to ensure that the operator is in control of its CAMP. They must ensure that the operator is aware of any such revision prior to the contract provider implementing those revisions. These procedures must include a method to re-evaluate the revisions (as described above) and determine if they continue to be acceptable to the operator. The manuals must identify who is responsible to ensure that this process is functioning and who has the authority to revise this process.

### **E. Determine Qualification to Perform Essential Maintenance for an Operator.**

1) *For EMPs.* Before identifying any maintenance provider in the listing required by GACAR Part 121, Appendix G, II (as an entity, the operator intends to authorize the accomplishment of essential maintenance for it), the operator shall, consistent with GACAR §§ 121.675, 121.679, and 121.691(a), conduct an onsite audit designed to determine that each proposed EMP has an adequate organization and provides competent personnel and adequate facilities and equipment for the essential maintenance intended. The audit shall ensure that the essential maintenance can be performed in accordance with GACAR Part 121, Appendix G, II.

2) *Communication Between the Operator and GACA.* Revisions to the contract maintenance provider or EMP listing are a normal part of doing business and, because in some cases it happens very frequently, its process should be well documented in the operator's manual. The revisions should occur through the provisions of GACAR Part 121, Appendix G, II. The operator must keep in its manual a list of other persons with whom it has arranged for the performance of any required inspections, maintenance, preventive maintenance, or alterations. Additionally, notification of the revision should occur through the provisions of GACAR § 121.151, where the operator must furnish the GACA with all changes and additions to its manual, including changes or additions to its list of other persons doing maintenance, etc.

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3) *C.A.S.E. Audit Report.* Operators may substitute a current C.A.S.E. audit report for the required onsite audit if the operator can determine that the C.A.S.E. audit addresses all of the elements above, the airline-specific requirements, and has been accomplished within the previous 6 months. The operator must perform an onsite audit of those elements that are not accomplished by the auditing organization.

**NOTE:** For EMPs, before identifying any maintenance provider in the listing required by GACAR Part 121, Appendix G, II as an entity that the operator intends to authorize to accomplish essential maintenance for it, the operator shall (in accordance with GACAR §§ 121.675, 121.679, and 121.691(a)) conduct an onsite audit designed to determine that each proposed EMP has an adequate organization and provides competent personnel and adequate facilities and equipment for the essential maintenance intended. The audit shall ensure that the essential maintenance can be performed in accordance with GACAR Part 121, Appendix G, II.

4) *Audit Report.* The operator must submit a copy of the audit report to the GACA and PI (Airworthiness) for review in a checklist or summary analysis form. That report should show how the operator made its determination that all of the requirements in this chapter have been adequately addressed.

### 4.5.1.19. TASK OUTCOMES.

**A. Complete the Task.** Completion of this task will result in one of the following:

- 1) If the operator's maintenance manual and contract maintenance provider are determined satisfactory, accept the manual and issue OpSpec D91 (if applicable).
- 2) If the operator's manual is determined to be unsatisfactory, return the manual for corrections.
- 3) If the contract maintenance provider is determined to be unsatisfactory, deny the operator the use of that provider.

**B. Document the Task.** File all supporting paperwork in the operator's GACA office file.

**C. Complete the GAR.**

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### **4.5.1.21. Future Activities.**

**A. Continuous Monitoring.** The process of risk management (RM) is continuous and goes hand-in-hand with the operator's CAMP. The operator must continuously update its programs and allocate its resources and activities to meet changes in its operating environment.

**B. Continuous Responsibility.** Inspectors must emphasize this continuing responsibility to operator management personnel.

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#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 2. Prorated Time Authorizations**

###### **4.5.2.1. GACA ACTIVITY REPORT (GAR).**

A. 3316 (AW)

**4.5.2.3. OBJECTIVE.** This section provides guidance in determining the prorated time for an item.

###### **4.5.2.5. GENERAL.**

**A. Definition of Proration.** Proration is a procedure to determine the time consumed under one maintenance system, and to establish the remaining time under a new system.

**B. How Proration is Used.** Operators often sell or lease their equipment to other operators. This “used” equipment will have accumulated a certain amount of time in service. This time is transferred to the new operator and may be phased in or prorated to the new operator’s approved time limitations.

**C. Buyer Options for Prorated Time.** When a buyer’s approved overhaul time limits are lower than those of the seller, the buyer has two options:

1) Elect to use the proration process.

2) Elect to use direct inclusion, providing the previous operator’s actual time since overhaul is less than the buyer’s approved overhaul time limit.

a) When using the direct inclusion option, the difference between the buyers approved overhaul time limit and the previous operator’s actual time since overhaul will determine the time remaining to the overhaul for the buyer.

b) When the buyer’s approved overhaul time limit is higher than that of the seller, proration procedures should be used to adjust the time since overhaul. However, based upon the buyer’s assigned aviation safety inspector’s (Inspector’s) (Airworthiness)

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comparison of the buyer's and seller's maintenance program for similarity, direct inclusion may be used if both programs are found comparable.

### **D. Scope and Limitations of Proration.**

- 1) Proration does not lessen an operator's responsibility to maintain the aircraft in an airworthy condition.
- 2) Proration is optional.
- 3) Life-limited components may not be prorated.
- 4) Proration may not be applied to times specified in Airworthiness Directives.
- 5) Operators who have been operating equipment under the General Authority of Civil Aviation Regulation (GACAR) Parts 121 and 135 may use proration.
- 6) Both adjusted and actual times must be shown on the proration document and the aircraft records.
- 7) When an item is inspected or overhauled as appropriate, the applicable prorated time limits will be canceled. Thereafter, the item will be handled according to the operator's approved program.
- 8) Partial proration is not acceptable. An operator electing proration must prorate the airframe and all of its installed powerplants, propellers, and appliances. Spare engines and propellers acquired at the time of sale or at a later date with "time in service" may be prorated.
- 9) If an increase in a time limitation is approved for an operator operating on prorated times, that increase will be credited to the prorated item(s).
- 10) Amendments to an operator's Operations Specifications (OpSpecs) that increase time limits apply to all aircraft of the same type and model operated by a carrier. Such time increases apply to aircraft operating on a prorated time basis, as well as to the other aircraft in the fleet.

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**E. Phasing in Foreign Aircraft.** Foreign operator aircraft may be phased into a Kingdom of Saudi Arabia (KSA) operator's program via proration. However, the KSA operator must first present satisfactory evidence that the program under which the aircraft was maintained is at least equivalent to the new operator's program for a similar type of aircraft.

### 4.5.2.7. DATA AND COMPUTATION.

**A. Computing Prorated Time.** Prorated time remaining can be determined by using the following mathematical procedures:

- 1) Divide the actual time used by the previous operator's approved time limit under which the aircraft has been operated. The result, carried to three decimal places, will represent the percentage of approved time already used.
- 2) Multiply the new operator's time limit by the percentage of time used. This will result in the prorated time to be used under the new program.
- 3) Subtract the prorated time from the time limit approved in the new program. The result will represent the number of hours remaining under the new program. (See Figure 4.5.2.1)

### B. Block/Pattern Time Limitation.

- 1) When block/pattern time is to be prorated, each block/pattern shall be treated as though a complete aircraft were being prorated.
- 2) When the previous operator used a block/pattern system, a document must be submitted showing the following:
  - Time limitation for each block or pattern, together with a list of items that are part of the block or pattern
  - Time since accomplishment for each individual item on the aircraft

### 4.5.2.9. COORDINATION REQUIREMENTS.

This task requires coordination between the Inspector and the operator.

### 4.5.2.11. REFERENCES, FORMS, AND JOB AIDS.

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### A. References:

- Federal Aviation Administration (FAA), Advisory Circular (AC), 120 17 (as amended), Maintenance Control by Reliability Methods.
- Operator's documentation, including OpSpecs, for previous and new operator

### B. Job Aids:

- Proration Formula Example (Figure 4.5.2.1)

#### 4.5.2.13. PROCEDURES.

**A. Receive Data From Operator.** The operator must submit required information to the General Authority of Civil Aviation (GACA) office.

- 1) The operator must submit all OpSpecs containing the time limits utilized for the particular aircraft by the previous operator.
- 2) If the OpSpecs do not show hours, the operator must submit other documentation that will establish the time limits.
- 3) If conversion to "hours" is necessary, the computations used for the conversion should be included.
- 4) The operator must provide OpSpecs pertinent to the particular aircraft.
- 5) The operator must submit documents itemizing the following:
  - Engines, propellers, and appliances that have different time limitations than the previous operator and are to be prorated. These will be listed by Air Transportation Association chapter numbering system, showing the name, part number, serial number, and position
  - The approved time under which the aircraft has been operated
  - The actual time since last accomplishment

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- Percent of time used by the previous operator
  - The approved time limitation for the new operator
- 6) When the previous operator used a block/pattern system, a document must be submitted showing the following:
- Time limitation for each block or pattern, together with a list of items that are part of the block or pattern
  - Time since accomplishment for each individual item on the aircraft

**B. Determine Eligibility.** Determine that the aircraft and/or components are eligible for proration.

**C. Check the Prorated Time Computation.** Times obtained via proration may be rounded to the nearest 10-hour figure (see Figure 4.5.2.1).

### 4.5.2.15. TASK OUTCOMES.

**A. Close the GAR.**

**B. Approve OpSpecs.**

**C. Document the Task.** File all supporting paperwork in the operator's office file.

### 4.5.2.17. FUTURE ACTIVITIES.

Normal surveillance.

#### FIGURE 4.5.2.1. PRORATION FORMULA EXAMPLE

The example below demonstrates the simple steps involved in determining a buyer's time remaining to overhaul.

##### Known

Previous operator's approved overhaul time limit = 8,000 hours

Previous operator's time since overhaul (TSO) = 2,000 hours

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Buyer's approved overhaul time limit = 12,000 hours

### Step One

Divide the previous operator's TSO figure by the previous operator's approved overhaul time limit. Carry this out to three places. The result represents the percentage of approved overhaul time already used.

250

8,000/2,000

In this example, 25 percent is the result.

### Step Two

Multiply the buyer's approved overhaul time limit figure by the decimal arrived at in Step One. The result is the prorated TSO to be used by the buyer.

12,000 x .250 = 3,000

In this example, 3,000 is the prorated TSO to be used by the buyer.

### Step Three

Subtract the prorated TSO arrived at in Step Two from the buyer's approved overhaul time limit. The resulting figure will be the number of hours remaining to overhaul for the buyer.

12,000

3,000

9,000

In this example, the buyer's prorated time remaining to overhaul is 9,000 hours.

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#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 3. Evaluate the Approval of Required Avionics Equipment and Instruments**

###### **4.5.3.1. GACA ACTIVITY REPORT (GAR).**

A. 3446 (AW)

**4.5.3.3. OBJECTIVE.** This section provides guidance for evaluating the approval of avionics equipment and instruments.

**4.5.3.5. GENERAL.** The General Authority of Civil Aviation Regulations (GACARs) requires that certain avionics instruments and equipment be approved regardless of whether the aircraft is operated commercially or non-commercially.

**A. Approval of Instruments and/or Equipment.** The certification process for GACAR Parts 121, 125, and 135 must include verification that the required instruments and equipment are approved. The instrument or equipment approval can be accomplished by the following:

- Use of a Technical Standard Order (TSO)
- Acceptance as part of the aircraft on the original Type Certificate (TC) or Supplemental Type Certificate (STC)
- Parts Manufacturing Approval (PMA)

**B. Verification of Approval.** Verification of approval can be accomplished by various means, such as visual inspection of the equipment manufacturer's data plate and/or review of applicable records, such as flight manual equipment lists or maintenance records.

###### **4.5.3.7. PREREQUISITES AND COORDINATION REQUIREMENTS.**

###### **A. Prerequisites.**

- Knowledge of the regulatory requirements of GACAR Parts 21, 91, 121, 125, and 135, as

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applicable

- Knowledge of the equipment/instruments to be approved

### **B. Coordination.**

- 1) Coordination with General Authority of Civil Aviation (GACA) Airworthiness Engineering personnel and/or the equipment manufacturer may be required when previous equipment approval has not been issued or operating limitations cannot be determined.
- 2) Equipment approvals for air operators may require coordination with principal operations or principal maintenance inspectors (PIs) in situations that involve lower landing minimums, long range navigation systems, flight control systems, etc.

### **4.5.3.9. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References.**

- GACAR Parts 21, 23, 25, 27, 29, 43, 91, 121, 125 and 135

#### **B. Forms.** GACA Activity Report (GAR).

#### **C. Job Aids.** None.

### **4.5.3.11. PROCEDURES.**

**A. Review the Applicable Regulations.** Determine which instruments and/or equipment require approval.

#### **B. Verify Approval.**

- 1) If the equipment data plate does not indicate the appropriate approval status, determine through the operator's records the method by which the equipment received approval.
- 2) Ensure that all avionics equipment requiring GACA approval has the appropriate documentation for that approval. If GACA approval cannot be substantiated, the equipment and/or aircraft cannot be used until it is substantiated by the owner/operator.

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- 3) Ensure that the equipment is used only on the aircraft for which it is approved.
- 4) Ensure that any spare instruments/equipment are approved. If substitutes are to be used as spares, verify their approval and the authority to install them on the aircraft.

**NOTE:** Instruments and equipment that have not been maintained or altered in accordance with accepted practices and procedures could affect the approval basis. Changes to the basic design of avionics equipment may render the approval invalid.

### **4.5.3.13. TASK OUTCOMES.**

#### **A. File GAR.**

**B. Complete the Task.** Completion of this task could result in a letter describing any limitation(s) on the use of the instrument or equipment until deficiencies are corrected or approval is obtained.

**C. Document Task.** File all supporting paperwork in the operator's GACA office file.

### **4.5.3.15. FUTURE ACTIVITIES.** Follow-up activity, as required.

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**CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

**Section 4. Evaluate Engineering Change Authorization for Part 121**

**4.5.4.1. GACA ACTIVITY REPORT (GAR).**

A. 3346 (AW)

**4.5.4.3. OBJECTIVE.** This section provides guidance for evaluating an Engineering Change Authorization/Order (EA/EO).

**4.5.4.5. GENERAL.**

A. An engineering change authorization/order provides an operator with a format for:

- 1) Documenting repairs and alterations to equipment the operator uses.
- 2) Recording General Authority of Civil Aviation (GACA)-approved data and procedures for accomplishing alterations and repairs to aircraft, propellers, powerplants, accessories, and components. If no previously approved data exists, the operator must obtain approval through the GACA Airworthiness Engineering Section.
- 3) Developing procedures and data used to comply with and provide verification of Airworthiness Directives.

B. In evaluating an engineering change authorization, an aviation safety inspector (Inspector) must approach this task in the same manner as reviewing/approving a repair or alteration.

**NOTE:** If an Inspector is not completely familiar with equipment involved in the engineering change authorization, GACA Airworthiness Engineering personnel should be contacted for assistance.

C. In reviewing an engineering change authorization, the Inspector should be aware that the authorization serves not only as a maintenance record but also as a planning document for the operator. The authorization will normally contain material and personnel requirements, diagrams

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(blueprints, schematics, etc.), detailed procedures, and sign-offs. The Inspector should ensure that all data is correct, complete, and does not conflict with existing authorizations or maintenance procedures.

**D.** If the engineering change authorization concerns new or modified equipment, maintenance procedures may have to be revised or developed. Coordination with the Principal Operations Inspector (POI) may be required to ensure that the operations manual and/or approved Aircraft Flight Manual (AFM) contain the revised or new procedures.

### **4.5.4.7. PREREQUISITES AND COORDINATION REQUIREMENTS.**

#### **A. Prerequisites.**

- Knowledge of the equipment involved in the engineering change authorization

**B.** Coordination. This task requires coordination between the Principal Maintenance Inspector (PMI), Principal Operations Inspector (POI), GACA Airworthiness Engineering Section, the manufacturer and the operator.

### **4.5.4.9. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References.**

- GACA-approved data (Maintenance/manufacturer's manuals, Supplemental Type Certificates, Airworthiness Directives, etc.)
- GACAR Parts 21, 43 and 121

#### **B. Forms.** GACA Activity Report (GAR).

#### **C. Job Aids.** None.

### **4.5.4.11. PROCEDURES.**

**A. Review the Operator's Submitted Engineering Change Authorization.** Ensure the following:

- 1) Operator's classification (minor/major) is correct.

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- 2) That the data has GACA approval.
- 3) Diagrams and procedures are clear, precise, and complete.
- 4) Proper materials are listed and employed.
- 5) Individual maintenance and inspection task sign-offs are provided for and are adequate to ensure authorization compliance.
- 6) The authorization does not affect existing systems and/or procedures.
- 7) Maintenance/operating manuals and procedures are revised to include new or revised procedures that may be required as a result of the authorization.

**B. Analyze Findings.** If discrepancies are noted, contact the operator and request corrective action.

### 4.5.4.13. TASK OUTCOMES.

#### A. File GAR.

**B. Complete the Task.** Successful completion of this task will result in the following:

- 1) For a minor engineering change authorization, discard the office copy of the authorization.
- 2) For a major engineering change authorization with previously approved data, file the authorization in the GACA office's operator file.
- 3) For a major engineering change authorization without previously approved data, accomplish one of the following:
  - Send the authorization to GACA Airworthiness Engineering Section for further evaluation and/or approval
  - When data is approved, inform the operator of the findings and return the signed original to the operator

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**C. Document Task.** File all supporting paperwork in the operator's office file.

**4.5.4.15. FUTURE ACTIVITIES.** Normal surveillance.

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#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 5. Evaluate Operator's Short-Term Escalation Procedures for Part 121**

###### **4.5.5.1. GACA ACTIVITY REPORT (GAR).**

A. 3320 (AW)

**4.5.5.3. OBJECTIVE.** This section provides guidance for evaluating General Authority of Civil Aviation Regulation (GACAR) Part 121 operator's short-term escalation procedures based on requirements for operations specification (OpSpec) D76, Short-Term Escalation.

**4.5.5.5. GENERAL.** An operator's time limitations, maintenance intervals, and instructions and procedures to conduct inspections, which include the necessary tests and checks, are an integral part of their maintenance and inspection program. This program is a fundamental component of the operator's Continuous Airworthiness Maintenance Program (CAMP). Generally, the inspection intervals in the operator's manual include a degree of safety to maximize aircraft reliability. Due to unanticipated circumstances, an operator might need to temporarily adjust the interval for an individual aircraft, system, or component.

###### **A. Use of a Short-Term Escalation Authorization.**

1) By authorizing the use of the operator's short-term escalation procedures, the General Authority of Civil Aviation (GACA) is allowing the operator to apply the limitations of OpSpec D76 to aircraft maintenance intervals, airframe component and appliance maintenance intervals, and powerplant component and accessory maintenance intervals. The limitations imposed by OpSpec D76 and the operator's procedures should not allow a short-term escalation that would compromise the airworthiness of an aircraft or any safety of flight issue. Unanticipated situations arise, such as contractor scheduling, conflicts in weather, parts availability, or other unscheduled maintenance, during which the short-term escalation of a maintenance interval may be used.

2) Principal maintenance inspectors (PMIs) must closely monitor the use of short-term escalation authorizations to ensure they are not being abused or used indiscriminately and that they do not conceal unsound maintenance practices, maintenance program deficiencies,

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or poor management decisions.

- 3) Short-term escalations for aircraft, aircraft systems, or components not subject to a reliability program may only be authorized by the issuance of OpSpec D76 or by GACA authorization on a case-by-case basis.
- 4) Operators operating aircraft, aircraft systems, or components under the controls of an approved reliability program may issue short-term escalations, provided that short-term escalation procedures have been incorporated into their reliability program.
- 5) The operator must provide policy, procedures, instructions, and/or information in the manual, which allows personnel concerned with short-term escalations to perform their duties and responsibilities to a high degree of safety.
- 6) A short-term escalation should only be used after the operator thoroughly evaluates all of the alternatives and gives careful consideration to the operating performance and the continued airworthiness of the aircraft, systems, and components. A review of the proposed escalation should include:
  - a) If the short-term escalation authorization applies to powerplants, powerplant accessories and components, propellers and gearboxes, and airframe accessories and components, the operator must provide previous inspection results or justifiable data from previous teardown reports.
  - b) If supplemental inspections are warranted during the escalation period to ensure continued airworthiness of the airframe, system, or component, the operator must provide the GACA with a supplemental inspection schedule.
- 7) Short-term escalations cannot be issued after an item has exceeded an established maintenance program time limitation. PMIs should monitor each short-term escalation to ensure that non-compliance with the operator's time limitations is not being hidden by the use of short-term escalations. PMIs should look at the current time limitation, the current time, and the proposed escalation to properly monitor for these situations.

**NOTE:** The short-term escalation must not be construed as a permanent escalation to the task or check interval.

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8) Maximum short-term escalation intervals may be a percentage of an existing time interval for a particular task, or may be designated in hours of time-in-service, cycles, or some other identifiable increment. Except under certain conditions, the maximum time allowable for a short-term escalation is 10 percent, not to exceed 500 hours/cycles, time-in-service.

Maintenance tasks or checks that are controlled by calendar days or years would also be limited by 10 percent, not to exceed the amount of days it would take the aircraft to reach the 500-hour time-in-service limit. (For example, if an operator's utilization is 10 hours a day, then a particular calendar task can be short-term escalated for a maximum of 10 percent but may not exceed 50 days ( $500 \text{ hours} \div 10 \text{ hours a day} = 50 \text{ days}$ ).) Operators must describe the methods and procedures for calculating short-term escalation intervals in their manual.

9) The operator must notify the GACA no later than the next working day following the operator's issuance of the short-term escalation. To ensure continuity between the GACA and the operator, it is recommended that the operator's program include procedures to notify the GACA by telephone within 24 hours after the authorization is issued, followed by written notification no later than 72 hours after.

**B. Extension of Short-Term Escalations.** The 10 percent, not to exceed 500-hour maximum time limit for a short-term escalation, is usually sufficient for an operator to accomplish required tasks. Under special conditions, an individual item may be extended beyond the maximum limit. The operator must perform sufficient analysis and provide adequate justification to the GACA to substantiate the extension request. All extension requests beyond the maximum limit require prior approval by the PMI.

**C. Prohibitions.** Short-term escalation procedures do not apply to the following:

- Intervals specified by Airworthiness Directives
- Life limits specified by type certificate data sheets
- Limitations specified by minimum equipment lists (MEL) or Configuration Deviation Lists (CDL)
- Structural sampling periods imposed by maintenance review boards
- Certification Maintenance Requirements (CMR) (unless specifically allowed and designated by the CMR document)

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### D. Buying Back of Time.

- 1) It cannot be assumed that all short-term escalation time granted, must be “bought back” at the next inspection. Each operator’s program must be evaluated during development and revisions to determine if and when a “buying back” of time may be required.
- 2) Operators routinely combine individual maintenance tasks with common intervals into letter checks. These letter checks normally run in a series (C1, C2, C3, etc.). The use of a short-term escalation authorization to extend a letter check that is part of a series of letter checks will also impact the compliance times of individual maintenance tasks that compile the checks. An example of this is as follows: A particular maintenance task is due every 4,000 hours and is added to the C check series. The C1 is due at 1,000 hours, the C2 at 2,000 hours, and so forth. In this scenario, the particular task was placed on the C4 for completion. Let’s say the operator exercises its short-term escalation process on the C2 check by escalating it 100 hours. After this escalation, the normal repeat interval of 1,000 hours is continued through the rest of the C check series. Now the operator does an individual maintenance task compliance audit and discovers that this particular task, which was required by their maintenance program to be completed at 4,000 hours, was actually completed at 4,100 hours (because of the short-term escalation exercised by the carrier for the C2). Even though this particular task was not part of the C2 package, it is acceptable for the task to have exceeded the maintenance program requirement in the amount equal to the short-term escalation authorized (maximum of 10 percent).
- 3) While constructing their check packages, operators should take particular care to avoid the possibility of including maintenance tasks that are prohibited from being short-term escalated (refer to subparagraph C above). If a carrier wishes to include those prohibited tasks, then the PMI and the operator must evaluate the effects of the short-term escalation and determine if “buying back” of time granted during the short-term escalation is required. If this situation was used in the above scenario and the particular 4,000-hour task was unacceptable for short-term escalation, then the carrier would be in violation unless the time was “bought back” after the C2 short-term escalation to avoid exceeding the 4,000-hour requirement of the task.

**NOTE:** For the purposes of this section, short-term escalation applies to both inspections and any other maintenance requirement (operational check, functional check, restoration, and discard) of the aircraft, aircraft appliances, and components. The only items not allowed

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to be subject to short-term escalation are listed in subparagraph C above.

**4.5.5.7. COORDINATION REQUIREMENTS.** This task requires coordination between the Inspector and the operator.

### **4.5.5.9. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Parts 119 and 121

#### **B. Forms:** GACA Activity Report (GAR).

#### **C. Job Aids:** None.

**4.5.5.11. PROCEDURES.** Review the operator's maintenance manual to ensure that:

- 1) The general policies section of the applicable manual contains the duties, responsibilities, and authority for any other management personnel and appropriate members of the ground organization (e.g., quality assurance (QA), quality control (QC), maintenance planning, recordkeeping; etc.)
- 2) The manual contains duties, responsibilities, and instructions to keep each of its employees and other persons used in its operations informed of the provisions of its OpSpec D76 that applies to that employee's or person's duties and responsibilities.
- 3) There are clear policies, procedures, instructions, and/or information to allow personnel concerned with the OpSpec D76 authorized short-term escalation process to perform duties and responsibilities to a high degree of safety.
- 4) The operator has inserted pertinent excerpts of its OpSpec D76, or references thereto, in its manual, identified each such excerpt as a part of its OpSpecs and has stated that compliance with each OpSpec D76 requirement is mandatory.
- 5) It defines the maximum limitations for a short-term escalation.
- 6) It contains criteria defining the type of data acceptable for justifying a short-term

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escalation and procedures to ensure that no short-term escalations are authorized without supporting data.

7) It corresponds with the overall maintenance program. The procedures must ensure that an escalation will not create an unsafe condition.

8) It restricts the occurrence of repetitive short-term escalations that indicate a need for a change in the maintenance program.

9) It provides a method for recording all escalations, with provisions for submitting/reporting each request/use of an escalation to the GACA.

10) There must be policies and procedures to ensure the short-term escalation program interacts with the Continuing Analysis Surveillance System (CASS). CASS must provide performance measurements to ensure the program is producing desired results.

### **4.5.5.13. TASK OUTCOMES.**

#### **A. Complete GAR.**

**B. Complete the Task.** Successful completion of this task will result in one of the following:

- A letter to the operator indicating denial of the short-term escalation authorization
- An amendment to the operator's OpSpecs, if applicable, authorizing short-term escalation authorization

**C. Document Task.** File all supporting paperwork in the operator's office file.

### **4.5.5.15. FUTURE ACTIVITIES.** Monitor the operation closely as follows:

- Ensure authorization is not being abused
- Ensure manual procedures are being followed
- Monitor the aircraft's records for inspection compliance
- Review the projected inspection schedule; ensure that the short-term escalation authorization

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requirements have been applied

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#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 6. Approved Parts and Parts Borrowing**

###### **4.5.6.1. GACA ACTIVITY REPORT (GAR).**

A. 3316 (AW)

**4.5.6.3. OBJECTIVE.** This section provides guidance for evaluating air operator's use of aircraft parts and parts borrowing arrangements.

**4.5.6.5. GENERAL.** An operator must ensure that all aircraft parts intended for use on their Saudi Arabian registered aircraft are accepted for use per General Authority of Civil Aviation Regulation (GACAR) Part 21.

**NOTE:** For additional guidance, see Volume 6, Chapter 2, Section 6, Parts Accepted for Use on Saudi Arabian Registered Aircraft.

**4.5.6.7. PARTS POOLS.** All air operators must ensure that they only use parts that are accepted for use under GACAR Part 21 regardless of whether the parts are sourced from their own stores or from part pools involving other operators.

**A. Foreign Facility Inspections.** The operator must have in its manual procedures to inspect the parts pooling facilities to ensure that parts intended for use on Saudi Arabian registered aircraft conform to GACAR Part 21 requirements. The manual also must include procedures to ensure the maintenance of parts according to the operator's maintenance manuals.

###### **4.5.6.9. PARTS BORROWING AUTHORIZATION.**

A. GACAR Part 121 operators may be issued operations specification (OpSpec) D83, "Short Term Escalation for Borrowed Parts Subject to Overhaul Requirements", to allow it to borrow a part with a higher time since overhaul than authorized under the operator's CAMP, subject to certain conditions and limitations. The operations specifications must specify that the operator can borrow a part from another operator when the time in service of the available part exceeds the operator's approved overhaul time limit. The parts, however, cannot exceed the lender's

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approved time limits.

**B.** If the number of landings controls the part's service or overhaul time limit, an operator may borrow and use a part for a maximum of 100 hours or 50 landings when the time in service of the part exceeds the borrower's approved time limits. The following limitations must be met:

- 1) The part must have a minimum time of 200 hours or 100 landings (if approved time is controlled by landings) remaining before service or overhaul in the lender's program.
- 2) The part is life limited; therefore the part may not be operated beyond its approved life limit.

**4.5.6.11. COORDINATION REQUIREMENTS.** This task requires coordination between the aviation safety inspector (Inspector) (Airworthiness) and the operator.

### **4.5.6.13. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References.**

- GACAR Parts 21 and 121
- Volume 6, Chapter 2, Section 6
- Volume 15, Chapter 3

#### **B. Forms.** GACA Activity Report (GAR)

#### **C. Job Aids.** None.

### **4.5.6.15. PROCEDURES.**

#### **A. Review Operator's Maintenance Manual for Parts Pooling.** Ensure the manual includes:

- 1) Procedures to ensure qualified personnel of the operator's organization perform an initial inspection of the involved foreign facilities. This inspection should ensure that facilities meet the operator's manual requirements, have properly qualified and trained personnel, and can furnish the parts intended.

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- 2) Procedures to provide for periodic inspections of the foreign facilities to ensure continued conformity with the operator's manual in supplying the required parts.
- 3) Inclusion of, or reference to, the foreign facilities' maintenance programs in the operator's manual, if applicable.

### **B. Review Operator's Maintenance Manual for Parts Borrowing .**

- 1) Ensure the manual includes the following procedures:
  - a) Procedures that restrict the overhaul time limits to those authorized by operations specifications.
  - b) Procedures that restrict a remaining minimum time to overhaul to that authorized by operations specifications.
- 2) Ensure the operator has an approved list of authorized vendors, repair stations, and air operators from which it may borrow parts.

**C. Analyze Results.** Advise the operator of any deficiencies discovered during the inspection. Schedule a meeting with the operator to discuss and/or resolve the problem area(s).

#### **4.5.6.17. TASK OUTCOMES.**

##### **A. Complete the GAR.**

**B. Complete the Task.** Successful completion of this task will result in issuance of the following OpSpec D83.

**C. Document Task.** File all supporting paperwork in the operator's GACA office file.

#### **4.5.6.19. FUTURE ACTIVITIES.** Normal surveillance.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 7. Approve Reliability Programs for Part 121**

###### **4.5.7.1. GACA ACTIVITY REPORT (GAR).**

- A. 3331 (AW) (New)
- B. 3332 (AW) (Revision)

**4.5.7.3. OBJECTIVE.** This section provides guidance for approving General Authority of Civil Aviation Regulation (GACAR) Part 121 reliability programs and providing technical assistance to the operator.

###### **4.5.7.5. GENERAL.**

- A. This task is performed by an aviation safety inspector (Inspector) (Airworthiness). Approving a reliability program is one of the most complex duties of an Inspector and special attention must be given to every element of the proposed program.
- B. Reliability programs establish the time limitations or standards for determining intervals between overhauls, inspections, and checks of airframes, engines, propellers, appliances, and emergency equipment. Guidance on the program elements is listed in Federal Aviation Administration (FAA) Advisory Circular (AC) 120-17 (as amended), Maintenance Program Management Through Reliability Methods; the Airline/Manufacturer Maintenance Program Planning Document, Maintenance Steering Group (MSG)-2/3; and/or Maintenance Tasks. It is important that the Inspector explains all of the program requirements to the operator.

###### **4.5.7.7. PRIMARY MAINTENANCE PROCESSES.**

###### **A. MSG-2, Primary Maintenance Processes Definitions.**

- 1) *Hard-Time (HT), Overhaul Time Limit, or Part Life-Limit.* This is a preventive primary maintenance process that requires a system, component, or appliance to be either overhauled periodically (time limits) or removed from service (life-limit). Time limits may only be

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adjusted based on operating experience or tests, in accordance with (IAW) procedures in the operator's approved reliability program.

2) *On-Condition (OC)*. This is also a preventive primary maintenance process that requires a system, component, or appliance be inspected periodically or checked against some appropriate physical standard to determine if it can continue in service. The standard ensures that the unit is removed from service before failure during normal operation. These standards may be adjusted based on operating experience or tests, as appropriate, IAW a carrier's approved reliability program or maintenance manual.

3) *Condition Monitoring (CM)*. MSG-2 introduced condition monitoring. This process is for systems, components, or appliances that have neither HT nor OC maintenance as their primary maintenance process. It is accomplished by appropriate means available to an operator for finding and solving problem areas. The user must control the reliability of systems or equipment based on knowledge gained by analysis of failures or other indications of deteriorations.

### B. MSG-3, Maintenance Task Definitions.

1) *Lubrication/Servicing (LU/SV)*. Any act of lubrication or servicing for the purpose of maintaining inherent design capabilities. The replenishment of the consumable must reduce the rate of functional deterioration.

2) *Operational/Visual Check (OP/VC)*. Hidden functional failure categories. An operational check is a task to determine if an item is fulfilling its intended purpose. The check does not require quantitative tolerances, but is a failure-finding task. A visual check is an observation to determine that an item is fulfilling its intended purpose and does not require quantitative tolerances. This is a failure-finding task that ensures an adequate availability of the hidden function to reduce the risk of a multiple safety failures and to avoid economic effects of multiple failures and be cost-effective.

3) Inspection/Functional Check (IN/FC), All Categories.

a) Inspections.

1. Detailed inspection. An intensive visual examination of a specific structural area, system, installation, or assembly to detect damage, failure, or irregularity.

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Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate by the Inspector. Inspection aids such as mirrors or magnifying lenses may be used. Surface cleaning and elaborate access procedures may be required.

2. General visual (surveillance) inspection. A visual examination of an interior or exterior area, installation, or assembly to detect obvious damage, failure, or irregularity. This level of inspection is made under normally available lighting conditions, such as daylight, hangar lighting, flashlight, or drop-light, and may require removal or opening of access panels or doors. Stands, ladders, or platforms may be required to gain proximity to the area being checked.

3. Special detailed inspection. An intensive examination of a specific item(s), installation, or assembly to detect damage, failure or irregularity. The examination is likely to make extensive use of specialized inspection techniques and/or equipment. Intricate cleaning and substantial access or disassembly procedures may be required.

b) Functional Check. A quantitative check to determine if one or more functions of an item perform within specified limits. Reduced resistance to failure must be detectable, and there must be a reasonably consistent interval between a deterioration condition and functional failure.

4) *Restoration (RS), All Categories.* That work necessary to return an item to a specific standard. Since restoration may vary from cleaning or replacement of single parts to a complete overhaul, the scope of each assigned restoration task has to be specified.

5) *Discard (DS), All Categories.* The removal from service of an item at a specified life limit. Discard tasks are normally applied to so-called single-celled parts such as cartridges, canisters, cylinders, engine disks, or safe-life structural members.

**4.5.7.9. NEW AIRCRAFT.** The lack of real experience with new aircraft requires a careful, detailed study of their characteristics to determine which components or systems would probably benefit from scheduled maintenance (HT or OC).

A. Special teams of industry and FAA personnel developed the initial maintenance programs for the B-747, DC-10, and L-1011 aircraft. Using the MSG-2 decision analysis, these teams

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identified potential maintenance tasks and determined which of these tasks must be performed to ensure operating safety or determine essential hidden function protection. The remaining tasks were evaluated to determine if they were economically useful.

**B.** This evaluation provided a systematic review of the aircraft design so that, in the absence of real experience, the best maintenance process could be employed for each component or system. The B-747, DC-10, and L-1011 aircraft operating experience confirmed the effectiveness of these procedures.

### **4.5.7.11. DATA COLLECTION SYSTEM.**

**A.** Typical sources of data collection include the following:

- Unscheduled removals
- Confirmed failures
- Pilot reports
- Sampling inspections
- Shop findings
- Functional checks
- Bench checks
- Service difficulty reports
- Mechanical Interruption Summaries
- Other sources the operator considers appropriate

**B.** Not all of these sources may be covered in each and every program. However, the availability of additional information provides the operator with an invaluable source of operating history for determining success or failure in meeting program goals.

**C.** Data collected must be accurate and factual to support a high degree of confidence for any

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derived conclusion. It must be obtained from units functioning under operational conditions and must relate directly to the established levels of performance.

**4.5.7.13. DATA ANALYSIS AND THE APPLICATION TO MAINTENANCE CONTROLS.** The objective of data analysis is to recognize the need for corrective action, establish what corrective action is needed, and determine the effectiveness of that action.

**A. Data Analysis Systems.** Data analysis is the process of evaluating mechanical performance data to identify characteristics indicating a need for program adjustment, revising maintenance practices, improving (modifying) hardware, etc. The first step in analysis is to compare or measure data against acceptable performance levels. The standard may be a running average, tabulation of removal rates for past periods, graphs, charts, or any other means of depicting a “norm.”

**B. Programs Incorporating Statistical Performance Standards (“Alert” Programs).**

- 1) Reliability programs developed under FAA AC 120-17, (as amended) and earlier criteria use parameters for reliability analysis such as delays per 100 departures for an aircraft system. They incorporate performance standards as described in Subparagraph 4.5.7.15 of this section. These standards define acceptable performance.
- 2) System performance data usually is reinforced by component removal or confirmed failure data. The condition-monitored process can be readily accommodated by this type of program.

**C. Programs Using Other Analysis Standards (“Non-alert” Programs).** Data compiled to assist in the day-to-day operation of the maintenance program may be used effectively as a basis for continuous mechanical performance analysis.

- 1) Mechanical interruption summaries, flight record review, engine monitoring reports, incident reports, and engine and component analysis reports are examples of the types of information suitable for this monitoring method. The number and range of inputs must be sufficient to provide a basis for analysis equivalent to the statistical programs standards.
- 2) Actuarial analysis should be conducted periodically to ensure that the current process classifications are correct.

### **4.5.7.15. PERFORMANCE STANDARDS.**

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**A.** The following factors are acceptable for establishing or revising a reliability program's performance standards:

- 1) Past and present individual operator and industry experience. If industry experience is used, the program must include a provision for reviewing the standards after the operator has gained 1 year of operating experience.
- 2) Performance analysis of similar equipment currently in service.
- 3) Aircraft or equipment manufacturers' reliability engineering analysis.
- 4) History of experience where reliability standards were acceptable to the airline industry.

**B.** If the program does not incorporate statistical performance standards or significantly deviates from the instructions in FAA AC 120-17.

1) Performance measurements expressed numerically in terms of:

- System or component failure
- Pilot reports
- Delays
- A/C operating hours
- Number of landings
- Cycles
- Other

2) Standards adjusted to:

- Operator's experience
- Seasonal

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- Environmental

### 3) Procedures for periodic review:

- Upward adjustment
- Downward adjustment

### C. Monitoring procedure:

- New aircraft
- Computing performance standards

### 1) No statistical performance standards:

- Do not approve program
- 2) Also any significant deviation from FAA AC 120-17, (as amended).

### **4.5.7.17. EVALUATING PROGRAM DISPLAYS AND STATUS OF CORRECTIVE ACTION PROGRAMS AND REPORTING.**

**A. Corrective Action System.** Corrective action should be positive enough to restore performance effectively to an acceptable level within a reasonable time. The corrective action system must include provisions for the following:

- 1) Notifying the organization responsible for taking the action.
- 2) Obtaining periodic feedback until performance reaches an acceptable level.
- 3) Encompassing methods that have been established for the overall maintenance program, such as work orders, special inspection procedures, engineering orders, and technical standards.
- 4) Critical failures in which loss of function or the secondary effects of failure could affect the airworthiness of the aircraft.

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### **B. Statistical Performance Standards System.**

- 1) A performance measurement expressed numerically in terms of system or component failure, pilot report, delay, etc. (bracketed by hours of aircraft operation, number of landing, operating cycles, or other exposure measurement) serves as the basis for the standard. Control limits or alert values are usually based on accepted statistical methods, such as standard deviations or the Poisson distribution.
- 2) Some applications use an average or base line method. The standard should be adjustable and should reflect the operator's experience during seasonal and environmental condition changes and variations.
- 3) The program should include procedures for periodic review and adjusting the program as appropriate.
- 4) The program should include procedures for monitoring new aircraft until sufficient operating experience is available to compute performance standards, normally one year.

### **C. Data Display and Reporting System.**

- 1) Operators with programs incorporating statistical performance standards ("alert" programs) should develop a monthly report, with appropriate data displays summarizing the previous month's activity. This report should include the following:
  - a) All aircraft systems controlled by the program in sufficient depth to enable the GACA and other recipients to evaluate the effectiveness of the total maintenance program.
  - b) Systems that exceeded the established performance standards and discussion of what action has been taken or planned.
  - c) An explanation of changes that have been made or are planned in the aircraft maintenance program, including changes in maintenance and inspection intervals and changes from one maintenance process/task to another.
  - d) A discussion of continuing over-alert conditions carried forward from previous reports.

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- e) The progress of corrective action programs.
- 2) Programs using other analytical standards (“non-alert” programs) should consolidate or summarize significant reports used in controlling their program to provide for evaluating program effectiveness. These reports may be computer printouts, summaries, or other forms. A typical program of this type reports the following information:
- Mechanical Interruption Summary (MIS) reports
  - Mechanical Reliability Reports (MRR)
  - Maintenance process/task and interval assignments (master specification)
  - Weekly update to the maintenance process and interval assignments
  - Daily repetitive item listing by aircraft
  - Monthly component premature removal report, including removal rate
  - Monthly engine shutdown and removal report
  - Quarterly engine reliability analysis report
  - Engine threshold adjustment report
  - Worksheets for maintenance process/task and interval changes (not provided to the GACA but the GACA approves the process/task changes)

**D. Program Review System.** The program should include a procedure for revision which is compatible with GACA approvals. The procedures should identify organizational elements involved in the revision process and the authority. The program areas requiring formal GACA approval include any changes to the program that involve the following:

- Procedures relating to reliability measurement/performance standards
- Data collection

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- Data analysis methods and application to the total maintenance program
- Process/task changes
- Adding or deleting components/systems
- Adding or deleting aircraft types
- Procedural and organizational changes concerning administration of the program

### **4.5.7.19. INTERVAL ADJUSTMENTS, PROCESS, AND/OR TASK CHANGES.**

#### **A. Maintenance Interval Adjustment, Process Category, and/or Task Change System.**

Reliability programs provide an operator with a method of adjusting maintenance, inspection, and overhaul intervals without prior FAA approval. This does not relieve the operator or the GACA of their responsibilities regarding the effects of the program on safety.

**NOTE:** If the Inspector has any doubt as to the soundness of a requested maintenance interval adjustment or task change, the inspector should coordinate the request with the GACA Airworthiness Engineering Section and the Director, Airworthiness Division.

**B. Procedures.** Procedures for adjusting maintenance intervals must be included in the program. Maintenance interval adjustments should not interfere with ongoing corrective action. There should be special procedures for escalating systems or components whose current performance exceeds control limits.

1) Typical considerations for adjusting HT or OC intervals include the following:

- Sampling
- Actuarial studies
- Unit performance
- Inspector or maintenance findings
- Pilot reports

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2) Methods for adjusting aircraft/engine check intervals should be included if the program controls these intervals. Sampling criteria should be specified.

**C. Classifying the Maintenance Processes and/or Tasks.** The program should include procedures for the classification and assignment of maintenance processes and/or tasks and for changing from one process and/or task to another. Refer to MSG-2 for maintenance processes and MSG-3 for maintenance tasks. It should include the authority and procedures for changing maintenance specifications and the related documents to reflect the interval adjustments or process and/or task change.

### **4.5.7.21. PREREQUISITES AND COORDINATION REQUIREMENTS.**

**A. Prerequisites:** Previous experience with the type of equipment the operator proposes to include in the program.

**B. Coordination.** This task requires coordination between the Airworthiness Inspectors. Further coordination may be required with the GACA Airworthiness Engineering Section and the Director, Airworthiness Division.

### **4.5.7.23. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- AC 120-17, Maintenance Control by Reliability Methods, (as amended)
- MSG-2/3 Documents

#### **B. Forms:** GAR.

#### **C. Job Aids:** None.

### **4.5.7.25. PROCEDURES.**

**A. Meet With Operator.** In addition to providing AC 120-17, (as amended), inform the operator of the following program requirements:

- Program application

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- Organizational structure
- Data collection system
- Methods of data analysis and application to maintenance control
- Procedures for establishing and revising performance standards
- Definition of significant terms
- Program displays and status of corrective action programs
- Procedures for program revision
- Procedures for maintenance control changes

**B. Evaluate the Program Application Procedures.** When the operator submits a formal program, ensure that the program document defines the following:

- 1) Components, systems, or complete aircraft controlled by the program. Individual systems and/or components are identified by Air Transport Association (ATA) Specification 100. A list of all components controlled by the program must be included as an appendix to the program document or included by reference (e.g., time limits, manuals, or computer report).
- 2) The portion of the maintenance program controlled by the reliability program (e.g., overhaul and/or inspection, check periods).

**C. Evaluate Organizational Structure.** The structure must be described adequately and address committee membership, if appropriate, and meeting frequency. Ensure that the reliability program includes an organizational chart that shows the following:

- 1) The relationships among organizational elements responsible for administering the program.
- 2) The two organizational elements responsible for approving changes to maintenance controls and specifying the duties and responsibilities for initiating maintenance program revisions.

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**NOTE:** One of the two organizations must have inspection or quality control responsibility or have overall program responsibility.

### **D. Evaluate the Organizational Responsibilities.**

1) Determine if the reliability program document addresses the following:

- The method of exchanging information among organizational elements. This may be displayed in a diagram
- Activities and responsibilities of each organizational element and/or reliability control committee for enforcing policy and ensuring corrective action

2) Ensure that authority is delegated to each organizational element to enforce policy.

### **E. Evaluate the Data Collection System.**

1) Ensure that the reliability document fully describes the data collection system for the aircraft, component, and/or systems to be controlled. The following must be addressed:

- Flow of information
- Identification of sources of information
- Steps of data development from source to analysis
- Organizational responsibilities for each step of data development

2) Ensure that the document includes samples of data to be collected, such as:

- Powerplant disassembly and inspection reports
- Component condition reports
- Mechanical delay and cancellation reports
- Flight record reports

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- Premature removal reports
- In-flight shutdowns
- Confirmed failure reports
- Internal leakage reports
- Engine shutdown reports

3) Ensure that the reliability document includes a graphic portrayal of program operations. It must be a closed loop and show source data, data collection, and analysis.

### **F. Evaluate the Methods of Data Analysis and Application to Maintenance Controls.** Ensure that the data analysis system includes the following:

1) One or more of the types of action appropriate to the trend or level of reliability experienced, including:

- Actuarial or engineering studies employed to determine a need for maintenance program changes
- Maintenance program changes involving inspection frequency and content, functional checks, overhaul procedures, and time limits
- Aircraft, aircraft system, or component modification or repair; and/or
- Changes in operating procedures and techniques

2) The effects on maintenance controls such as overhaul time, inspection and check periods, and overhaul and/or inspection procedures.

3) Procedures for evaluating critical failures as they occur.

4) Documentation used to support and initiate changes to the maintenance program, including modifications, special inspections, or fleet campaigns. The program must reference the operator's manual procedures for handling these documents.

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5) A corrective action program that shows the results of corrective actions in a reasonable period of time. Depending on the effect on safety, a “reasonable” period of time can vary from immediate to an overhaul cycle period. Each corrective action plan or program must be made a matter of record and include a planned completion date. Samples of forms used to implement these actions must be included in the program document.

6) A description of statistical techniques used to determine operating reliability levels.

### **G. Evaluate the Procedures for Establishing and Revising Performance Standards.**

1) Ensure that each program includes one of the following for each aircraft system and/or component controlled by the program:

- Initial performance standards defining the area of acceptable reliability
- Methods, data, and a schedule to establish the performance standard

2) Ensure that the performance standard is responsive and sensitive to the level of reliability experienced and is stable without being fixed. The standard should not be so high that abnormal variations would not cause an alert or so low that it is constantly exceeded in spite of the best known corrective action measures.

3) Ensure that the procedures specify the organizational elements responsible for monitoring and revising the performance standard, as well as when and how to revise the standard.

**H. Evaluate Definitions.** Verify that each program clearly defines all significant terms used in the program. Definitions must reflect their intended use in the program and will therefore vary from program to program. Acronyms and abbreviations unique to the program also must be defined.

### **I. Evaluate Program Displays and Status of Corrective Action Programs and Reporting.**

1) Ensure that the program describes reports, charts, and graphs used to document operating experience. Responsibilities for these reports must be established and the reporting elements must be clearly identified and described.

2) Ensure that the program displays containing the essential information for each aircraft,

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aircraft system, and component controlled by the program are addressed. Each system and component must be identified by the appropriate Air Transport Association of America (ATA) Specification 100 system code number.

3) Ensure that the program includes displays showing:

- Performance trends
- The current month's performance
- A minimum of 12 months' experience
- Reliability performance standards ("alert" values)

4) The program must include the status of corrective action programs. This includes all corrective action programs implemented since the last reporting period.

### **J. Evaluate the Interval Adjustments and Process and/or Task Changes System.**

1) Review the change system procedures. Ensure that there are special procedures for escalating systems or components whose current performance exceeds control limits.

2) Ensure that the program does not allow for the maintenance interval adjustment of any Certification Maintenance Requirements (CMR) items. CMRs are part of the type certification basis. No CMR item may be escalated through the operator maintenance/reliability program. CMRs are the responsibility of GACA Airworthiness Engineering as far as approval and escalation.

**NOTE:** The operator may not use its reliability program as a basis for adjusting the repeat interval for its corrosion prevention and control program; however, the operator may use the reliability program for recording data for later submission to the GACA to help substantiate repeat interval changes.

3) Ensure that the program includes provisions for notifying the GACA when changes are made.

### **K. Evaluate the Procedures for Program Revisions.** The reliability document must accomplish

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the following:

- 1) Identify and isolate areas which require GACA approval for program revision, including the following:
  - Reliability measurement
  - Changes involving performance standards, including instructions relating to the development of these standards
  - Data collection system
  - Data analysis methods and application to maintenance program
  - Any procedural or organizational change concerning program administration
- 2) If the operator proposes that the GACA approve all revisions to the program document, isolation of those areas requiring GACA approval is not required. However, the document must recognize each of the above requirements and must contain procedures for adequately administering and implementing changes required by these actions.
- 3) Identify the organizational element responsible for approving amendments to the program.
- 4) Provide a periodic review to determine that the established performance standard is still realistic.
- 5) Provide procedures for distributing approved revisions.
- 6) Reference the operator's maintenance manual and provide the overhaul and inspection periods, work content, and other maintenance program activities controlled by the program.

**L. Evaluate the Procedures for Maintenance Control Changes.** Ensure that the reliability program document addresses the following:

- 1) Procedures for maintenance control changes to the reliability program.
- 2) The organizational elements responsible for preparing substantiation reports to justify maintenance control changes. At least two separate organizational elements are required,

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one of which exercises inspection or quality control responsibility for the operator.

- 3) Processes used to specify maintenance control changes (e.g., sampling, functional checks, bench checks, decision tree analysis, and unscheduled removal).
- 4) Procedures covering all maintenance program activities controlled by the program.
- 5) Procedures for amending OpSpecs, as required.
- 6) Procedures to ensure maintenance interval adjustments are not interfering with ongoing corrective actions.
- 7) Critical failures and procedures for taking corrective action.
- 8) Procedures for notifying the GACA, when increased time limit adjustments or other program adjustments are addressed.

**M. Analyze Reliability Program Evaluation.** Upon completion, record all deficiencies noted. Determine the appropriate corrective action(s) to be taken. Deficiencies noted in the program must be given to the operator in writing.

### 4.5.7.27. TASK OUTCOMES.

**A. File GAR.**

**B. Completion.** Successful completion of this task will result in the approval of the operator's reliability program with OpSpec D74 or D75.

**C. Document Task.** File all supporting paperwork in the operator's GACA office file.

### 4.5.7.29. FUTURE ACTIVITIES.

Normal surveillance.

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#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 8. Approve Contract Maintenance Reliability Program for Part 121**

###### **4.5.8.1. GACA ACTIVITY REPORT (GAR).**

A. 3331 (AW) (Initial)

B. 3332 (AW) (Revision)

**4.5.8.3. OBJECTIVE.** This section provides guidance for approving contract reliability programs for General Authority of Civil Aviation Regulation (GACAR) Part 121 operator.

###### **4.5.8.5. GENERAL.**

###### **A. Definitions:**

1) *Operator*: An operator contracting with another operator for a maintenance program controlled by a reliability program.

2) *Contractor*: An operator contracting out to another operator an approved maintenance program controlled by a reliability program.

**B. Responsibility.** This task is performed by the aviation safety inspector (Inspector) (Airworthiness) assigned to the operator. Special attention must be given to evaluate each element of a proposed program.

###### **4.5.8.7. CONTRACTUAL MAINTENANCE AGREEMENTS.**

**A.** Contractual maintenance agreements are used by operators for various reasons, including:

- The impracticality of staffing and equipping maintenance facilities
- Lack of a technical support staff to develop effective maintenance programs

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- Insufficient reliability control due to a lack of statistical data

**B.** Under contractual maintenance agreements, an operator's aircraft are treated as part of a contractor's operating fleet. The operator is not required to develop its own reliability program for this arrangement. The operator must, however, have a continuing analysis and surveillance system (GACAR § 121.691) and must participate in the contractual arrangement as necessary to uphold its airworthiness responsibilities.

**C.** An operator must provide the Inspector with the information and data needed to show the effectiveness of this agreement.

**D.** Traditionally, an aircraft maintenance program is based on:

- Integrity of the system, component, or installation
- The capability of the facility performing the maintenance
- The types of operation and environmental conditions in which the equipment is used

**E.** Equipment similarities and operating characteristics, such as utilization, flight cycle length, and environment must be considered when evaluating a contractual arrangement. Program approval and the need to adjust inspection intervals, overhaul periods, etc., must be based on the suitability of the program.

**4.5.8.9. OPERATOR AND CONTRACTOR COMPATIBILITY.** When evaluating a contractual arrangement for a reliability program, the following must be considered:

**A. Equipment.** When model, configuration, or previous maintenance programs vary between the operator's equipment and the contractor's equipment, the program must identify the maintenance tasks required to include the operator's equipment in the contractor's program. The program also must show additional tasks required to address specific differences in equipment.

**B. Utilization.** If the operator's projected annual utilization differs significantly from the contractor's, consideration should be given to imposing calendar limits for inspection intervals in place of or in addition to flight hours.

**C. Flight Cycle Length.** If the operator's ratio of flight hours per cycle differs significantly from

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the contractor's ratio, the operator's maintenance program may need adjustment to compensate for the differences.

**D. Environment.** The operator's maintenance program may also need to be adjusted if the operating environments of the operator and contractor differ significantly. The operator may need to change existing maintenance tasks, adjust intervals, and/or add new maintenance tasks.

**4.5.8.11. RELIABILITY PROGRAM DOCUMENT.** When an operator develops reliability programs for use by other operators, the reliability program document must define the responsibilities of the participating operators and include procedures for interface between the two. The document must be based on the premise that the operator adopts appropriate portions of the contractor's CAMP.

**4.5.8.13. DATA ANALYSIS.** The contractor's reliability program must describe the data analysis system. The contractor should consolidate all data collected, analyze the data, and return it to the operator in a usable form. This analysis should compare the mechanical performance of the operator's aircraft to acceptable levels and to the performance of the contractor's fleet.

**4.5.8.15. PROGRAM DISPLAYS AND STATUS OF CORRECTIVE ACTION PROGRAMS.** Displays and reports must highlight the systems that have exceeded the established performance standard. "Over alert" conditions should be carried over from previous reports and a status of ongoing corrective action should be provided.

**A.** The contractor's program must describe the reports, charts, and graphs used to document operating experience. Responsibilities for these reports must be established and the reporting elements must be clearly identified and described.

**B.** A program display, containing the essential information for each aircraft, aircraft system, and component controlled by the program must be described. Each system and component must be identified by the appropriate Air Transportation Association Specification 100 system code number.

**C.** The following must be displayed:

- Performance trends
- The current month's performance (graphical or tabular presentations may be used)

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- A minimum of 12 months experience
- The reliability performance standards (alert values)

**D.** The status of corrective action programs must include all corrective action programs implemented since the last reporting period.

**E.** The contractor must have manual procedures or a contractual requirement to provide the operator with reports that reflect performance experience and status of corrective action.

**4.5.8.17. CONTRACTUAL AGREEMENT.** The requirements imposed on the contractor by the operator's maintenance program, reliability program, and operations specifications must be supported by the contractual agreement. The operations specifications issued to the operator are not binding on the contractor. It is the operator's responsibility to ensure that all requirements of the specifications, program, and manual are met.

**4.5.8.19. APPROVAL.** The Inspector assigned to the operator will approve the use of the reliability program by issuing OpSpec D74 or D75. Program changes must be approved by the GACA either on an individual basis or by procedures approved as part of the reliability program.

**4.5.8.21. COORDINATION REQUIREMENTS.** This task may requires coordination between Airworthiness Inspectors and Airworthiness Engineers.

### **4.5.8.23. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Parts 25 and 121
- Advisory Circular (AC) 120-17 (as amended), Maintenance Control by Reliability Methods
- MSG-3
- The operator's maintenance program

#### **B. Forms:** GAR.

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**C. Job Aids:** None

### **4.5.8.25. PROCEDURES.**

**A. Meet With the Operator.** Provide the operator with the appropriate information.

- 1) Upon request for reliability program information, provide FAA AC 120-17, (as amended).
- 2) Advise the operator that the application for authorization to use a contractor's reliability program consists of at least the following documents:
  - Contractor's approved reliability program
  - Operator's manual procedures to support the reliability program
  - Operations specifications checklist/worksheet
  - The contractual agreement between the operator and the contractor
- 3) Advise the operator that the reliability program must include the following:
  - a) For the operator and contractor:
    - Adequate organizational structure
    - Data collection and analysis
    - Program revisions
    - Details of contractual arrangements
  - b) For the contractor only:
    - Adjustment of time limits and process changes
    - Definition of significant terms
    - Procedures for revising performance standards

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- Provisions for compatibility between the operator and the contractor regarding types of equipment, operational environment, flight length, and aircraft utilization

### **B. Contact the Contractor's PMI.** Accomplish the following:

- 1) Ensure that the contractor has a valid certificate, an approved continuous airworthiness maintenance program, and an approved reliability program (if applicable) for the type equipment operated by the operator.
- 2) Review the content of the contractor's reliability program (if applicable).
- 3) Determine the types of equipment the operator has in operation.

### **C. Determine if the Operator's and the Contractor's Equipment, Utilization, Flight Cycle Length, and Environment are Compatible.**

### **D. Evaluate the Program Application Procedures.** Ensure that the contractor's reliability program includes the following:

- 1) Components, systems, or complete aircraft controlled by the program. Individual systems and/or components are identified by Air Transportation Association Specification 100. A list of all components controlled by the program must be included.
- 2) Evaluation of conditions and trends found during the inspection of the aircraft that will result in corrective action.

### **E. Evaluate the Operator's and the Contractor's Organizational Structures .** The organizational charts must show the following:

- 1) The relationship between the participants responsible for administering the program.
- 2) The authority delegated to each organizational element.

### **F. Evaluate the Organizational Responsibilities.**

- 1) Ensure that the contractor's reliability program document and the operator's procedures describe how information is to be exchanged between organizational elements. This may be

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displayed in a diagram.

2) Ensure that the reliability program document and the operator's procedures define the activities and responsibilities of each organizational element (Engineering, Quality Control, Flight Operations, etc.) and/or reliability control committee for enforcing policy and Compare the operator's organizational structure and personnel duties and responsibilities with the requirements in the contractual agreement and the reliability program.

### **G. Evaluate the Data Collection System.**

1) Ensure that the contractor's program fully describes the data collection system as it relates to the aircraft, components, and/or systems to be controlled. The program must:

- Address the flow of information
- Identify any sources of information
- Specify the steps of data development from source to analysis
- Describe the organizational responsibilities for each step of data development

2) Ensure that the program includes samples of data to be collected, such as reports for the following:

- Powerplant disassembly and inspection
- Component condition
- Mechanical delay and cancellation
- Flight log
- Premature removal
- In-flight
- Confirmed failure

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- Internal leakage
- Engine shutdown

3) Verify that the operator's manual includes procedures for collecting the required data and sending it to the contractor in accordance with the contractual arrangement. The required data should include corrective actions as well as shop repair records for work performed away from the contractor's facility.

### **H. Evaluate the Methods of Data Analysis and the Application to Maintenance Controls.**

Ensure that the data analysis system includes the following:

1) One or more of the types of action appropriate to the trend or level of reliability experienced, such as:

Actuarial or engineering studies employed to determine a need for maintenance program changes

Maintenance program changes involving inspection frequency and content, functional checks, overhaul procedures, and time limits

Aircraft, aircraft system, or component modification or repair

Changes in operating procedures and techniques

2) Effects on maintenance controls, such as overhaul time, inspection and check periods, and overhaul and/or inspection procedures.

3) Procedures for evaluating critical failures as they occur.

4) Documentation required for maintenance program changes, modifications, special inspections, or fleet campaigns. The contractor's manual must provide procedures for retaining these documents.

5) A corrective action program that shows the results of corrective actions in a reasonable period of time. Depending on the effect on safety, a "reasonable" period of time can vary from immediate to the time period of an overhaul cycle.

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- 6) A description of statistical techniques used to determine operating reliability levels.
- 7) Procedures to inform the operator of changes to maintenance controls.
- 8) Data analysis that considers the past experience of both the contractor and the operator.
- 9) An adequate, timely flow of information between the contractor and the operator.

**I. Evaluate the Operator's Maintenance Manual.** Ensure that the operator has manual procedures to accomplish the following:

- 1) Performing corrective action through the person responsible.
- 2) Notifying persons responsible for taking corrective action.
- 3) Informing the contractor when corrective action changes were made and the extent of those changes.
- 4) Follow-up to ensure corrective actions taken are effective.

**NOTE:** A corrective action is effective if the out-of-limit condition is brought back to an acceptable level of performance.

**J. Evaluate the Procedures For Revising the Reliability Program.** Ensure that there are procedures for the contractor to obtain GACA approval before changing any of the following elements of the reliability program:

- Performance standards
- Data collection
- Data analysis system
- Process/task
- Procedures/organization concerning program administration

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- Changes from alert-type programs to non-alert-type programs or vice versa
- Adding or deleting aircraft, components, or systems

**NOTE:** Changes to these aspects of the reliability program must be coordinated between the Principal Maintenance Inspectors assigned to the operator and the contractor.

### **K. Evaluate the Procedures for Revising Performance Standards.**

- 1) Ensure that the contractor's procedures specify the organizational elements responsible for monitoring and revising the performance standard and the content of those revisions. Performance standards should be revised when they are not responsive or sensitive enough to reflect changes in actual performance.
- 2) If the operator submits a program which does not incorporate statistical performance standards or which deviates significantly from FAA AC 120-17, as amended, contact the contractor's assigned Principal Maintenance Inspector.
  - a) Examine the basis for the deviations and the integrity of the program and determine if any restrictions apply.
  - b) If unresolved issues about the contractor's program remain, contact the Director, Airworthiness Division for guidance.

**L. Evaluate Definitions.** Verify that the reliability program clearly defines unique terms, acronyms, and abbreviations as applied to the program.

**M. Evaluate the Program Displays and the Status of Corrective Action Programs.** Ensure that the contractual agreement or the contractor's manual requires the contractor to provide the operator with reports that reflect performance experience and corrective action status.

**N. Evaluate the Procedures for Maintenance Control Changes.** Verify that the contractor's reliability program document:

- 1) Describes the procedures for maintenance control changes to the reliability program.
- 2) Identifies the organizational elements responsible for preparing reports that justify

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maintenance control changes. At least two separate organizational elements are required, one of which exercises inspection or quality control responsibility for the operator.

- 3) Specifies the processes used to determine maintenance control changes, such as sampling, functional checks, bench checks, decision tree analysis, and unscheduled removal.
- 4) Provides procedures to cover all maintenance program activities controlled by the program,
- 5) Recognizes critical failures and contains procedures for taking corrective actions.
- 6) Provides procedures to ensure that any maintenance interval adjustments will not interfere with ongoing corrective actions.
- 7) Contains procedures for notifying the GACA when time limitations adjustments or other program changes occur.

**O. Review the Contractual Arrangement.** Ensure that the contract accomplishes the following:

- 1) Identifies the participating parties.
- 2) Identifies all applicable equipment.
- 3) Defines the responsibilities of both contracting parties.
- 4) Supports the responsibilities of the contractor specified in the reliability program.

**P. Inspect the Contract Maintenance Facility.** Determine if the contractor is capable of meeting its contractual obligations.

**Q. Analyze the Findings.**

- 1) Record all deficiencies noted.

**NOTE:** If discrepancies are found in the approved reliability program, contact the contractor's PMI to resolve the discrepancies.

- 2) Determine the appropriate corrective action(s) to be taken.

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3) Advise the operator of discrepancies. Agree on the corrective actions to be taken.

**4.5.8.27. TASK OUTCOMES.**

A. Complete the GAR.

B. Completion of this task results in one of the following:

- Issued OpSpec (D74 or D75) authorizing the use of the contractor's reliability program
- A letter to the operator denying the authorization

C. Document Task. File all supporting paperwork in the operator's GACA office file.

**4.5.8.29. FUTURE ACTIVITIES.** Normal surveillance.

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#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 9. Evaluate an Aircraft Inspection Program for Part 135**

###### **4.5.9.1. GACA ACTIVITY REPORT (GAR).**

A. 3343 (AW) (Initial)

B. 3344 (AW) (Revision)

**4.5.9.3. OBJECTIVE.** This section describes how to evaluate and approve a General Authority of Civil Aviation Regulation (GACAR) Part 135 operator's aircraft inspection program. When approved, such a program is referred to as an Approved Aircraft Inspection Program (AAIP).

**4.5.9.5. GENERAL.** For GACAR Part 135 operations, an operator must comply with all maintenance requirements of GACAR Parts 43, 91, and GACAR §§ 135.241, 135.243, 135.249, 135.695, and 135.697. Upon the operator's request, an approved aircraft inspection program may be used under GACAR § 135.245.

A. Aviation Safety Inspectors (Inspectors) should become thoroughly familiar with the type of operation. Special attention should be given to:

- Areas of operation
- Type of equipment (size and complexity)
- Operating history
- Maintenance/inspection organization, as applicable

B. The AAIP is used in lieu of the aircraft inspection requirements of GACAR § 91.449. However, it does not supersede other requirements of GACAR Part 91, such as the altimeter system tests and equipment check. An AAIP can include additional maintenance requirements specified by GACAR § 135.249, repetitive Airworthiness Directives (AD) compliance, Airworthiness Limitation Items, and life-limited part retirement times, but the AAIP cannot

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override or alter Airworthiness Limitation Items, or AD or life-limited requirements.

**C.** An AAIP is authorized for use by operations specification (OpSpec) D73, Approved Aircraft Inspection Program (AAIP).

**D.** The use of scheduling “windows” can be approved by principal maintenance inspectors (PMIs) with certain stipulations. The use of “windows” will not significantly affect the target inspection interval. The scheduling flexibility that is realized through the use of “windows” should all but eliminate any special requests for time escalation. “Windows” should not be considered a justification for accomplishing “piecemeal” inspections, nor should it become a de facto permanent time extension. Once an inspection segment is initiated (i.e., panels opened), it should be completed before the aircraft is placed back in service. In addition, “windows” should not permit extensions of AD compliance times, Airworthiness Limitations, or life limited part retirement times.

**4.5.9.7. CHANGES TO AAIP and/or AAIP TIME INTERVALS.** Whenever the General Authority of Civil Aviation (GACA) finds that revisions to an approved aircraft inspection program are necessary for the continued adequacy of the program, the operator shall, after notification by the GACA, make any changes in the program found by the GACA to be necessary. The operator may petition the GACA to reconsider the notice to make any changes in a program under the procedures prescribed in GACAR Part 13.

### A. Operator-Initiated Changes.

1) The operator may ask to amend inspection or overhaul intervals.

a) The operator must justify the request using the following:

- Past operating experience
- Environmental conditions
- Inspection program provisions
- At least one overhaul tear-down report
- Any other data necessary to substantiate changes

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- b) Operator-initiated time changes require revisions to both the AAIP and OpSpecs.
- 2) Amendments or extensions are not permitted for retirement times of life-limited parts, Airworthiness Limitation Items, and/or those intervals designated by ADs unless authorized in GACA-approved revisions of the controlling document.

### B. Manufacturer Escalations.

- 1) If a manufacturer extends its recommended inspection or overhaul interval, the operator may request approval to use the extension by submitting a revision to the AAIP. The request must be accompanied by the manufacturer's recommendation.
- 2) Inspectors should not automatically approve a time escalation recommended by the manufacturer. The individual operator's aircraft use and experience must be considered. The Inspectors should ensure that the escalation will not compromise safety.

**4.5.9.9. MAINTENANCE MANUAL.** The AAIP must be included in the operator's maintenance manual (MM). The operator should request a manual revision (in accordance with manual revision procedures) at the same time the AAIP/revision is submitted for approval. This allows the GACA to approve the AAIP/revision and accept the manual concurrently, while advancing implementation of the program.

**NOTE:** The aircraft inspection program included in the operator's manual must contain the following:

- Instructions and procedures for the conduct of aircraft inspections (which must include necessary tests and checks), setting forth in detail the parts and areas of the airframe, engines, propellers, rotors, and appliances, including emergency equipment, that must be inspected
- A schedule for the performance of the aircraft inspections expressed in terms of the time in service, calendar time, number of system operations, or any combination of these
- Instructions and procedures for recording discrepancies found during inspections and correction or deferral of discrepancies including form and disposition of records

**4.5.9.11. COORDINATION REQUIREMENTS.** This task is performed by principal maintenance inspectors (PMI). It may require coordination with principal operations inspectors (POI).

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### 4.5.9.13. REFERENCES, FORMS, AND JOB AIDS.

#### A. References:

- GACAR Parts 43, 91, and 135
- FAA AC 135-10 (as amended), Approved Aircraft Inspection Program.

#### B. Forms: GACA Activity Report (GAR).

#### C. Job Aids: None.

### 4.5.9.15. PROCEDURES.

#### A. Schedule and Conduct Preliminary Meeting, (As Needed).

- Advise operator of regulatory requirements and policies
- Remind the operator that the AAIP/revision must be included in the policies and procedures manual

#### B. Plan and Coordinate Task.

- Determine whether the aircraft meets eligibility requirements
- Review operator file to identify any information concerning the AAIP/revision. Determine its effect on the operator's other programs or procedures.
- If this task is performed as part of an original certification, review the Schedule of Events to ensure that the evaluation can be accomplished according to the schedule

#### C. Evaluate the Proposed Program/Revision.

1) Evaluate instructions, procedures, and standards for conducting inspections.

a) The program must include:

- Airframe

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- Aircraft engines
  - Propellers
  - Rotors
  - Appliances
  - Survival and emergency equipment
- b) When establishing an AAIP, the program may include installed avionics and instrument systems. These systems are not always installed by the aircraft manufacturer and may not be included in their recommended inspection program.
- c) Inspection methods, techniques, and standards, or other technical data may be included in the program by reference. Such references may be either the airframe manufacturer's or the appliance manufacturer's service data. However, when both the airframe manufacturer and the appliance manufacturer provide inspection data, the airframe manufacturer's data should be used.
- d) The avionics and instrument systems inspections may be based on the manufacturer's recommendations, or Instructions for Continued Airworthiness.
- e) All tests and checks recommended by the aircraft or equipment manufacturer should be addressed.
- f) The instructions, procedures, and standards must be clear and easily understood. They must identify the scope of each task and provide a detailed outline of each step that must be accomplished to perform the inspection and ensure that established performance standards are met.
- 2) Evaluate the procedures for controlling life-limited parts retirement times. The program must contain provisions to ensure that records are current. Life limits must be expressed in one of the following measures:
- Length of time-in-service

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- Number of cycles
- Number of landings
- Calendar time
- A combination of the above measures

3) Evaluate procedures for scheduling inspections.

- a) The program must list inspection intervals for each inspection task and describe personnel responsibilities for scheduling and performing inspections.
- b) Procedures must ensure that inspections are performed by properly certificated, qualified, trained, current, and authorized personnel. The program must identify, by title, the person responsible for ensuring that personnel accomplishing inspections under the AAIP meet regulatory requirements.

4) Ensure that engine overhaul periods correspond to the recommended overhaul intervals in the engine manufacturer's manuals and/or service bulletins.

5) Evaluate procedures for reporting and correcting mechanical irregularities. The program must include detailed instructions, procedures, and the necessary forms and documents for the recording and repair of mechanical irregularities. These instructions, procedures, and forms may appear elsewhere in the company manual, but their location must be referenced in the AAIP.

6) Ensure that the AAIP includes instructions on its use.

**D. Analyze Findings.** Determine if program changes are required.

**E. Debrief Operator.** Discuss results of the evaluation, including any deficiencies noted during inspection.

### 4.5.9.17. TASK OUTCOMES.

**A. File the GACA Activity Report (GAR).**

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**B. Complete the Task.** Completion of this task will result in one of the following:

1) If the AAIP/revision is not acceptable, advise the operator by letter that the program/revision is rejected. Give the reasons for the rejection. Return the program proposal and documentation to the operator.

a) If this review is performed as part of a certification, inform the operator in the letter that the certificate will not be issued until the deficiencies are corrected. If necessary, advise the operator to revise the Schedule of Events.

b) The letter must also accomplish the following:

- Confirm all agreements made during the debriefing
- Identify the date the AAIP/revision was submitted
- Show the revision number and date, as applicable
- Identify and describe all deficiencies by chapter, section, page, etc.
- Reference each deficiency to the appropriate regulation
- Request a revised Schedule of Events, if necessary
- If a revision, remind operator not to implement the revision

2) If the program or revision meets all regulatory requirements, accomplish the following:

- a) Ensure that the AAIP or revision has been fully coordinated within the GACA.
- b) For a new or totally revised program, indicate “Approved and authorized for use on operations specifications dated” on the first page identifying the program.
- c) The approving PMI shall sign and date the document.
- d) Send the operator a letter advising the AAIP is approved. The letter must accomplish the following:

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- Confirm all information given during the debriefing
- Indicate the date that the AAIP/revision was submitted
- Show the revision number and date, if applicable
- If a revision, indicate the number of approved pages
- Advise the operator that the revision may be implemented
- If a manual revision was submitted and is acceptable, advise the operator of acceptance
- If a manual revision was not submitted, remind the operator to revise the manual to incorporate the program/revision. Advise the operator to submit the manual change for acceptance
- Enclose the stamped, dated, and initialed original AAIP
- Enclose the accepted manual revision, if appropriate
- Issue/update OpSpec D73, Approved Aircraft Inspection Program (AAIP)

### **4.5.9.19. FUTURE ACTIVITIES.**

**A. Schedule of Events.** In the case of original certification, review the Schedule of Events to determine if a revised Schedule of Events is necessary.

**B. Procedures and Policies Manual.** Ensure that the Procedures and Policies Manual includes the AAIP/revision.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 10. Emergency Evacuation Systems (EES) Scheduled Maintenance Requirements**

**4.5.10.1. PURPOSE.** This section outlines regulatory requirements and General Authority of Civil Aviation (GACA) policy regarding scheduled maintenance requirements and failure/defect reporting regarding emergency evacuation systems (EES) for General Authority of Civil Aviation Regulation (GACAR) Part 121 operators.

**4.5.10.3. DEFINITION.** For the purposes of this section, besides the emergency evacuation (egress) systems themselves, the term “EES” encompasses components of any aircraft exits that can affect the availability of the emergency evacuation function, including any of the exit doors or hatches, slides, slide/rafts, exit door, or hatch locking or unlocking mechanisms, exit door or hatch opening or closing assist mechanisms, tail cone release mechanisms, arm/disarm mechanisms, slide activation mechanisms, electronic slide monitoring systems, and slide-to-airframe attachments/interfaces.

**4.5.10.5. REGULATORY REQUIREMENTS.** The regulation that addresses emergency equipment maintenance requirements is GACAR § 121.505(a), which states, “Must be inspected regularly in accordance with inspection periods established in the aircraft maintenance schedule to ensure its condition for continued serviceability and immediate readiness to perform its intended emergency purposes.”

**4.5.10.7. EES MAINTENANCE REQUIREMENTS.** Aviation safety inspectors (Inspectors) should ensure that the operator’s EES maintenance requirements are an integral part of their operator’s maintenance program. The operator uses these EES maintenance requirements, coupled with their Continuing Analysis and Surveillance (CASS) Program, to ensure that their EESS are in a serviceable condition and are ready to perform their intended emergency purpose.

**4.5.10.9. MAINTENANCE ORGANIZATION.** Inspectors should also ensure that the operator’s maintenance organization ensures, through its CASS, that all maintenance personnel perform all EES maintenance in accordance with the operator’s manual. The maintenance organization must also ensure that EES maintenance is effective; that it produces the desired result. If an Inspector notes that the operator is experiencing an increase in the level of unscheduled EES maintenance that may be an indicator of discrepancies in the maintenance program related to EES. The operator should

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thoroughly investigate any failure of an EES. The operator should establish a root cause for the failure so that the appropriate corrective action can be applied. Inspectors should also ensure that the operator's maintenance program has provisions to ensure that competent personnel, adequate facilities, and equipment are provided for EES maintenance.

### **4.5.10.11. EES MAINTENANCE TRAINING.**

**A. Maintenance Personnel.** Because of the complexity and safety-critical nature of EES maintenance, the operator must ensure that each individual performing maintenance or inspections for it on EES is properly trained and qualified, understands the operator's maintenance instructions, and is competent to perform the EES task assigned.

**B. Training Program.** As one of the means of demonstrating compliance with the competent personnel requirement, the operator should document EES maintenance and inspection personnel training for its EES personnel. In addition, Inspectors should encourage the operator to consider including recurrent training as part of its training program to ensure the competency and currency of any of its maintenance providers. Inspectors should also encourage the operator to promote the best practice of safety-critical awareness to any person who works with or around EES on its aircraft.

**4.5.10.13. EES MAINTENANCE TIME LIMITATIONS.** The inspection tasks and inspection periods for EES should confirm the continued serviceability and immediate readiness of EES for their intended emergency purpose. The operator must establish inspections and inspection periods that are designed to establish that all components of the emergency equipment and emergency egress systems installed on their aircraft are complete and serviceable and may be expected to remain in this condition until either the next inspection or an actual use under emergency conditions.

**NOTE:** Because of the confusion and uncertainty related to using Maintenance Steering Group—2 (MSG-2) process terminologies, Inspectors should ensure that the operator does not use MSG-2 terminology for EES in an operator maintenance time limitations document. For clarity, the operator should list EES inspection requirements in their maintenance time limitations using Maintenance Steering Group—3 (MSG-3) task descriptions. This is a straightforward requirement as MSG-2 process requirements must be managed on a task basis rather than a process basis. In other words, the operator should determine what the actual EES task(s) being accomplished under the process label and list those task(s) in the maintenance time limitations instead of the process label. Exclusive use of the process label

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can mask what actual scheduled maintenance task being accomplished actually is.

**B. Inspection Tasks.** Two of the types of tasks that are used in aircraft maintenance are failure-finding tasks, which identify functional failures (those that have occurred already) and failure prevention tasks, which identify potential failures (those that are in the process of occurring but have not occurred yet). A good EES overall maintenance strategy encompasses both types.

**C. Risk Assessment Process.** To satisfy the regulatory requirement, the operator should include in its maintenance time limitations OpSpecs, a system of EES tasks consisting of on-aircraft inspections, measurements, or tests designed to determine the item's or system's capability to immediately perform its intended emergency purpose. This is potential failure-finding where the purpose of the task is to look for degradation of the item's resistance to failure. Deployment or operational checks (failure-finding) of an evacuation slide or a door system may be included and used on a sampling basis to help validate the effectiveness of overall EES maintenance strategy. However, failure-finding tasks do not prevent failures as they can find failures only after the failure has occurred. In the maintenance program effectiveness (desired results) part of CASS for EES, an increase in failures during slide deployments or door operational checks has a negative impact (increased likelihood) on EES maintenance effectiveness and must initiate a corresponding increase in the sampling rate. This is a basic risk assessment/risk management process (RMP). However, evacuation slide deployment checks (operational checks) are failure-finding tasks that leave the evacuation slide in an unserviceable condition and not ready to perform its intended function. Deployment checks are, therefore, not suitable for compliance with the GACAR § 121.505 inspection requirement.

**D. Scheduled Slide Deployments.** If the operator chooses to use scheduled slide deployments, they may use a combination of on-aircraft operational tests, inspections, and test fixture usage provided the test fixture accurately replicates the aircraft installation.

**E. Inadvertent Slide Deployments.** While a source of useful information, the operator should not use inadvertent or actual emergency use deployment as the sole source of information to determine the effectiveness of their operator's EES maintenance program.

1) Actual emergency use, or an inadvertent EES deployment, by their very nature are failure-finding tasks that involve checking whether or not a function(s) is available. They are a qualitative task that does not require quantitative tolerances. They are operational checks. Failure-finding provides a yes or a no answer to the questions: Did it work? Was the

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function available? An EES functional check, on the other hand, is a quantitative check designed to determine whether one or more functions of the EES performed within specified limits or parameters. A functional check involves a collection of numbers which are compared to a performance standard; on the other hand, an operational check (inadvertent or actual emergency use EES deployment) does not collect numbers.

2) Since an inadvertent or actual emergency use EES deployment does not generate any quantitative data, the operator cannot satisfy the compliance or the data collection requirements of a functional check. Therefore, Inspectors should ensure that the operator does not use inadvertent or actual emergency use deployments to show compliance with any EES scheduled functional deployment check. If the operator chooses to use functional checks as a part of its overall EES program, Inspectors should ensure that these tasks are accomplished according to the task interval listed in their maintenance time limitations. The operator can't take credit for a functional check with data from an inadvertent or actual emergency use EES deployment.

3) Additionally, since most inadvertent deployments occur in the jetway or catering truck, they do not generate any qualitative data since determination of whether or not the function(s) are available is usually not possible. Therefore, Inspectors should ensure that the operator does not use inadvertent EES deployments to show compliance with any scheduled EES operational check requirement where a determination of the availability of the function is not possible.

**4.5.10.15. EES CASS.** The primary function of a Continuing Analysis and Surveillance (CASS) is to identify and correct maintenance program discrepancies that could set the stage for an accident/incident. Essentially, the CASS should continuously evaluate the operator's maintenance program, including the maintenance time limitations; maintenance procedures; maintenance methods, techniques, and practices; maintenance manual; and training related to EES. The operator's CASS should achieve this through a continuing cycle of surveillance, data collection, data analysis, corrective action, and follow-up.

**A. EES Failure Reporting.** Consistent with the reporting requirements of GACAR § 121.1553(a)(17), Inspectors should ensure that the operator has maintenance program procedures for reporting any failure, malfunction, defect, or loss of function of any EES or component. Consistent with the plain language requirements of GACAR § 121.1553, these reporting requirements apply when these adverse occurrences take place during an actual emergency, or

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during training, testing, maintenance, or demonstrations, whether the EES is installed on an aircraft or not.

**B. EES Airworthiness Release.** The operator must have airworthiness release or log entry procedures for any on-aircraft EES maintenance, in accordance with GACAR § 121.1545.

**4.5.10.17. ACTION.** If you are an Inspector with certificate responsibility for operators using aircraft with EES, you should verify that the operator is complying with all of the requirements of the regulations, including:

**A. EES Functional Checks.** The operator does not use inadvertent or actual emergency use deployments to show compliance with EES functional check requirements listed in its maintenance time limitations.

**B. EES Operational Checks.** The operator does not use inadvertent deployments to show successful compliance with any scheduled EES operational check requirement where a determination of the availability of the function is not possible.

**C. Reporting Requirements.** The operator has incorporated in its maintenance program EES failure/defect reporting procedures that are consistent with the regulations. The regulations require that each operator report all failures/defects of an EES including EES equipment that is:

- 1) Found defective, or
- 2) That fails to perform its intended functions during an actual emergency or during training, testing, maintenance, demonstrations, or inadvertent deployments (see GACAR § 121.1553(a)(17)). Basically, this means just about any EES failure any time.

**D. Name and Location.** The operator provides the name and physical location of the individual who is responsible for the GACAR § 121.1553(a)(17) .

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

##### **Section 11. Evaluate an Operator Aircraft Storage Program for Part 121**

###### **4.5.11.1. GACA ACTIVITY REPORT (GAR).**

A. 3341 (AW) (Initial)

B. 3342 (AW) (Revision)

**4.5.11.3. OBJECTIVE.** This section provides information and guidance to evaluate aircraft storage programs used by air operators operating under General Authority of Civil Aviation Regulation (GACAR) Part 121.

**4.5.11.5. BACKGROUND.** The primary purpose of an aircraft storage program is preservation. Storage programs are intended to preserve the aircraft in a known state through methods, techniques, and procedures designed to mitigate or eliminate the adverse effects of the storage environment and non-operation of the aircraft. An effective storage program will allow the operator to readily return the stored aircraft to an operational status.

**4.5.11.7. DEFINITIONS.** For the purposes of this section, the following definitions apply:

**A. Storage (General).** An operator's aircraft is considered stored when it is removed from active, operational status for any reason while the aircraft remains on the operator's operations specifications (OpSpecs). The level of preservation depends on the length of storage; the aircraft design features, and the storage environment (inside/outside, etc.).

**B. Short Term Storage.** An aircraft is subject to short term preservation procedures when it is removed from operational status for less than 60 days.

**C. Intermediate Term Storage.** An aircraft is subject to intermediate term preservation procedures when it is removed from operational status for more than 60 days, but less than 120 days.

**D. Long Term Storage.** An aircraft is subject to long term preservation procedures when it is

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removed from operational status for 120 days or more.

### **4.5.11.9. GENERAL.**

**A.** Occasionally, and for a variety of reasons, an operator will take an aircraft out of service (OTS) for a period of time. Depending on the circumstances, the time period can be a couple of days to a number of years to indefinitely.

**B.** The level of preservation depends on variables, such as the planned length of storage and the storage environment.

### **4.5.11.11. PART 121 AIRCRAFT STORAGE PROGRAMS.** As stated earlier, aircraft storage programs are intended to mitigate or eliminate the effects of a non-operational status by implementing various levels of preservation.

**A.** Preservation is included in the scope of the maintenance function along with inspection, repair, overhaul, and the replacement of parts.

**B.** Aircraft storage programs are an integral part of the operators maintenance programs required by GACAR § 121.667. Storage programs are developed and documented consistent with GACAR § 43.13(c) in the manual as required by GACAR §§ 121.139, 121.143, 121.151 and 121.683. Operator aircraft storage programs do not require any specific General Authority of Civil Aviation (GACA) approvals other than the GACAR § 43.13(c) process.

**C.** Each operator should have a storage program that is unique to its type of aircraft make/model /series (M/M/S), storage environment, and operational needs. Aviation safety inspectors (Inspectors) should not expect a storage program to be exactly the same from one operator to the next.

**D.** Generally, aircraft storage programs will have procedures for placing the aircraft in various levels of preservation, for de-preserving the aircraft when placing it back in service, for accomplishing inspections or other maintenance designed to mitigate or eliminate the effects of preservation, and de-preservation, and for documenting all of these actions.

**E.** Some aircraft manufacturers have recommended storage programs currently in place. These programs are not to be considered mandatory for operators to implement. Operators may use all, some, or none of these recommendations while developing their own specific storage program.

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However, it is important to note that some manufacturers may have specific airworthiness requirements based on proper storage/preservation and that the operator must address these requirements when returning the aircraft to an airworthy condition.

**4.5.11.13. AIRCRAFT OPSPECS LISTING.** Operator aircraft that are removed from service and preserved in accordance with the operator's storage program should remain on the aircraft OpSpecs listing. If the aircraft is removed from OpSpecs, the operator loses the authority to operate the aircraft, to perform maintenance on that aircraft as well as the authority to use its storage program. Furthermore, the operator's principal maintenance inspector (PMI) loses the oversight responsibility/authority for those aircraft that are not on the operator's aircraft listing. However, if the operator places an aircraft in a non-operational status, but doesn't preserve it to an appropriate level in accordance with a storage program, then the PMI should remove that aircraft from the aircraft OpSpecs listing. The PMI can take this action under the provisions of GACAR § 119.51(a)(1), due to the safety concerns of creating an unknown airworthiness status by not preserving the aircraft. The public interest is served by not allowing the aircraft to be used in air transportation until the operator demonstrates the required airworthiness status to the GACA.

### **4.5.11.15. STORED AIRCRAFT SCHEDULED MAINTENANCE REQUIREMENTS.**

**A.** OpSpec D72, Aircraft Maintenance—Continuous Airworthiness Maintenance Program (CAMP) Authorization, gives the operator the authorization to conduct operations under GACAR Part 121 as long as the requirements set forth in the OpSpec are complied with. It is important to understand that these OpSpec authorization requirements are for operational aircraft. Aircraft placed in storage, with or without a storage program, are not intended for operation; therefore, they do not fall under the requirements of the OpSpec until the carrier intends to operate the aircraft.

**B.** However, the storage program may include other scheduled maintenance requirements or other required actions that are particular to the storage environment and to the level of storage. For example, engine runs may be required on a weekly basis for engines that have not been preserved. Another example is servicing dehumidifying equipment/material on a scheduled basis. Still another example is moving the aircraft from one side of the ramp to the other and turning it 180 degrees every 3 months. In any case, in addition to the procedures implemented to preserve the aircraft and place it in storage, the storage program should contain a schedule for accomplishment of all tasks required to maintain the aircraft in the intended level of preservation.

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**4.5.11.17. STORED AIRCRAFT AIRWORTHINESS CERTIFICATES.** Depending on the level of preservation, intended length of storage, and the security of the aircraft, the operator should consider removing the Standard Airworthiness Certificate and the certificate of registration from each stored aircraft for safekeeping.

- A. Inspectors must consider a number of factors when evaluating a Standard Airworthiness Certificate issued to a stored aircraft.
- B. It is implicit in the terms and conditions of the Airworthiness Certificate that the subject aircraft is being or will be operated. However, when an aircraft is preserved and placed in storage, it is similarly implicit that the aircraft is not going to be operated. The Standard Airworthiness Certificate of a preserved and stored aircraft is not to be considered revoked, suspended, or terminated. The Standard Airworthiness Certificate becomes ineffective when the requirements for maintenance, preventive maintenance (PM), and alterations pursuant to GACAR Parts 21, 43, and 91 are not complied with. The Standard Airworthiness Certificate of a preserved and stored aircraft is restored to a state of being effective when all maintenance, PM and alterations required by the operator maintenance program are complied with. The operator storage program should have clear procedures for ensuring that all of the maintenance program requirements as well as the appropriate regulatory requirements are complied with before approving it for return to service.

**4.5.11.19. UTILIZATION OF PARTS FROM AIRCRAFT IN STORAGE.** It is common practice for operators to remove parts from aircraft that are in storage (regardless if the aircraft is on OpSpec D85, Aircraft Listing, or not). Inspectors must remember that the GACA has no regulatory authority to dictate where carriers obtain their parts. The responsibility lies with the carrier/installer to determine that all parts used on type-certified products are acceptable for installation. The major concern is maintenance requirements becoming “overdue” on parts that have been installed on aircraft while in storage. The operators receiving inspection process must detail the procedures to ensure this responsibility.

**4.5.11.21. AIRCRAFT MOVEMENT WHILE IN STORAGE STATUS.** Movement (operation) of a stored aircraft from one place to another by air with the intention of keeping it in storage should be an unusual event. However, before any operation of an operator aircraft that has been preserved and stored in accordance with the operator’s storage program can take place, the operator must complete procedures for de-preserving the aircraft and accomplish those maintenance actions necessary to return the aircraft to an airworthy status. The storage program should clearly outline these procedures and maintenance actions.

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- A.** If the aircraft is not being moved to accomplish maintenance, movement of a preserved and stored aircraft can become complex if Airworthiness Directive (AD) requirements and scheduled maintenance requirements are past due. PMIs should pay close attention to the special flight permit restrictions and requirements of any overdue AD, as well as the terms and conditions of the operator's continuing authorization to issue special flight permits for maintenance, if appropriate.
- B.** The procedures and actions required for operating a preserved and stored aircraft from one storage place to another should not be significantly different from those for returning the aircraft to a full operational status. The PMI should provide oversight of the movement of the aircraft.

**4.5.11.23. RETURN TO SERVICE FOLLOWING STORAGE.** Storage programs are meant to preserve an aircraft, not require the accomplishment of normal scheduled maintenance. At a minimum, operators must ensure the aircraft conforms to applicable airworthiness requirements and limitations of their maintenance program and the regulations. It must be understood that all time, especially calendar time, accrued while in storage must be counted when determining what scheduled maintenance is due once the aircraft is returned to service.

### **4.5.11.25. OPSPEC D106, AIRCRAFT IN LONG TERM MAINTENANCE OR STORAGE.**

- A.** OpSpec D106 is issued to those operators who wish to suspend the aircraft liability insurance on specific aircraft that are in long term maintenance or storage. These aircraft cannot be used by the operator during this time. The issuance of this OpSpec voluntarily holds Parts A, B, C, and R of the OpSpecs in suspense for only those aircraft listed in Table 1 of OpSpec D106. Part D maintenance paragraphs are not suspended, which allows the maintenance programs to remain active.
- B.** The operator is not required to have liability insurance specified in GACA Economic Regulation 8.1 while an aircraft is in long term storage.

**NOTE:** The notification and reporting requirements contained in GACA Economic Regulation Section 8.1, and GACAR § 119.55 remain in effect and must be complied with at all times.

**4.5.11.27. COORDINATION REQUIREMENTS.** This task requires coordination with Airworthiness and Operations Inspectors.

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### 4.5.11.29. REFERENCES, FORMS, AND JOB AIDS.

#### A. References:

- GACAR Parts 21, 119 and 121
- Volume 4, Chapter 3, Section 1, Evaluate Continuous Airworthiness Maintenance Program (CAMP) for Part 121
- Volume 4, Chapter 5, Section 1, Evaluate Outsource Maintenance Arrangement for Part 121 (if applicable)
- Volume 15, Chapter 3

#### B. Forms. GACA Activity Report (GAR).

#### C. Job Aids. None

### 4.5.11.31. PROCEDURES.

**A. Review the Manual.** The operator's maintenance manual or other document should define adequate procedures to preserve aircraft while in storage. The areas of preservation in the paragraphs below will prevent the deterioration of the aircraft, engines, structure, finish, and/or system components. Operators may have all of these, some of these, or even additional areas in their manual based on the complexity of their aircraft and the amount of time it will be in storage. Operators must consider the location where the aircraft will be stored; i.e., inside and protected from the environment, or outside, in which case environmental conditions must be considered (high winds, dust, sand, humidity, unusual pollutants, etc.). The need for repetitive inspections to ensure preservation methods are adequate must also be considered. The areas of preservation may include the following:

1) Airframe. This may include:

- Installation of protective coverings and closing of all external openings (except drains)
- Parking/mooring procedures

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- Installation of safety pins
- Washing of aircraft (due to environment, may be repetitive)
- Landing gear strut servicing, lubricating and protection of the oleo
- Tire inflation and rotation
- Fuel system decontamination
- Gust locks
- Primary and secondary flight control cycling and lubrication
- Protection of windows
- Procedures for the removal of parts or components
- Inspection of seats and carpet for moisture/mildew (if stored in humid environments)
- Preserving lavatories and water systems
- Opening of closets, cabinets, and interior doors to supply ventilation and to prevent mildew

2) Engine/Auxiliary Power Unit (APU). This may include:

- Procedures to operate the engine/APU on an established interval
- Complete preservation of the engine/APU (e.g., pickling)
- Procedures for the removal of parts or components

3) Electrical. This may include:

- Opening/closing of circuit breakers
- Battery servicing/disconnection

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- Removal of batteries from emergency devices, such as megaphone, flashlights, power supplies for emergency lights, emergency beacons, etc.
- Procedures for the removal of parts or components

### 4) Operational Checks. This may include:

- Procedures to transition the aircraft from preservation to a state acceptable for engine operations and operational checks of systems, back to the preserved state
- Operational checks of hydraulics, electrical, engine, fuel systems and avionics, etc.

**B. Review Contracts with Operator Maintenance Providers.** A maintenance provider may be used to store and preserve aircraft. These providers are required to perform all functions in accordance with the operator's manual and be monitored by the operator's Continuing Analysis and Surveillance System (CASS). If contracts were negotiated, the PMI should review this document to ensure the operator's manual procedures will be followed (see Section 1 of this Chapter).

**C. Review Procedures for Movement of the Aircraft in a Storage Status.** Occasionally, operators may need to fly an aircraft that is in storage to another location to perform maintenance. The operator must have procedures in place to ensure an aircraft is in safe condition for the intended flight. The manual must include procedures to:

1) Ensure that flights conducted under this provision are conducted in accordance with OpSpec D84, Special Flight Permit with Continuous Authorization to Conduct Ferry Flights, and/or OpSpec D95, Minimum Equipment List (MEL).

**NOTE:** The subject aircraft must be listed on OpSpec D85 in order to be operated as authorized in OpSpecs D84 and D95. If the aircraft is not listed on OpSpec D85, then the requirements of GACAR § 21.103(a) apply.

2) De-preserve the aircraft based on any preservation methods used during storage (i.e., protective coverings/Standard Airworthiness Certificates, engine pickling, and fuel system additives).

3) Conduct inspections or operational checks necessary to ensure the aircraft is safe for the

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intended flight.

- 4) Ensure that the aircraft is evaluated for inoperative systems or removed components/accessories and their effect on the intended flight. This includes determining mass and balance changes on the aircraft.
- 5) Obtain approval from personnel with authority and responsibility for authorizing the movement of aircraft in storage status.
- 6) Determine that ADs, which must be complied with before flight, are so complied with.

**D. Review Procedures for Returning the Aircraft to an Airworthy Condition.** Regardless of what procedures an operator has in its manual on preserving an aircraft in storage, the manual must have procedures on how to return an aircraft to airworthy condition once taken out of storage. These procedures must include a records check and compliance audit of the maintenance program. All time limited (flight hours, cycles, or calendar) items that went overdue during the storage period must be brought back into compliance. Review the manual to determine if it includes procedures to:

- 1) Define lines of responsibility and authority for personnel involved in ensuring the aircraft is returned to service properly.
- 2) Audit the current status of the aircraft to the maintenance program and comply with required tasks, including ADs, life-limited components, Certification Maintenance Requirements (CMR), avionics databases, etc.
- 3) De-preserve the aircraft based on any preservation methods used during storage (i.e., protective coverings/Standard Airworthiness Certificates, engine pickling, and fuel system additives).
- 4) Conduct other inspections and operational checks, as deemed necessary, based on the amount of time the aircraft was in storage and the environment to which it was exposed.
- 5) Conduct any operational check flights or test flights prior to return to service.

### 4.5.11.33. TASK OUTCOMES.

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**A. GAR.** Complete GAR Record.

**B. Complete the Task.** Successful completion of this task will result in the acceptance of the storage program submitted as part of the CAMP. If requested by the operator, issue OpSpec D106.

**C. Document the Task.** File all supporting paperwork in the operator's GACA office file.

**4.5.11.35. FUTURE ACTIVITIES.** Normal surveillance.

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**CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135**

**Section 12. Avionics Software Changes**

**4.5.12.1. OBJECTIVE.** This task provides guidance for the control and monitoring of an operator's avionics software changes to line replaceable units (LRUs).

**4.5.12.3. GENERAL.**

**A. Definition.** Partitioned System: A hardware/software system that is designed to separate safety related functions from other functions. This ensures that no action in a non-safety related function can cause a failure in a safety related function.

**B. Post-Type Certification Software Changes.** Post-type certification software changes can be required when the following occurs:

- System functional capability changes

- Design errors are discovered during service

1) When making a post-type certification software change, care must be taken as even the smallest change can lead to “secondary errors” in the software. Secondary errors are errors that were not present or whose effects were not detected when the system was first type certificated.

2) Because only changes to safety related software will be treated as a major alteration, it is necessary to predetermine what software will be affected by the change.

3) Most current system designs use a software program which is not partitioned. Use of a non-partitioned system makes it necessary to determine if the proposed changes affect safe aircraft operation by evaluating the functions performed by the system. Public address systems, passenger entertainment, and galleys are examples of systems which do not affect safety.

4) Care must be taken to ensure that partitioning actually exists, especially when

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implemented in software. When partitioning does exist, changes may be made to non-safety related software without General Authority of Civil Aviation (GACA) approval of the methods used for verification and validation.

**C. Design Changes.** If an operator wishes to design changes to the object code (software) of a line replaceable unit, it must establish and comply with a software verification and validation program equivalent to that described by RTCA/DO-178A, Software Considerations in Airborne Systems and Equipment Certification.

- 1) A software verification and validation program is not necessary if the operator only wishes to modify line replaceable units by incorporating software which has been previously approved by the GACA.
- 2) The level of sophistication and effort needed for original design changes made to the resident software differs from that needed for the incorporation of a pre-approved software change. A pre-approved software change can be accomplished by:
  - Installing a new memory device which contains the approved object code
  - Loading the approved object code into a programmable device contained within the line replaceable unit

**D. Maintenance Program.** The principal maintenance inspector (PMI) has responsibility for the approval of the operator's avionics maintenance program. The maintenance program must provide for the proper maintenance/inspection of all avionics equipment and components, including complete systems.

- 1) Changes to the software which performs functions affecting the safe operation of the aircraft should be treated as major alterations. All other software changes should be treated as minor alterations.
- 2) The operator must establish that partitioning exists prior to making changes to software which does not affect safety when such software is contained in a system which does affect safety.
- 3) When a software change has been previously approved, an operator may modify equipment by incorporating the software change, even when the software change is related

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to aircraft safety.

**4.5.12.5. COORDINATION REQUIREMENTS.** This task requires coordination with the operator, GACA Airworthiness Engineers, and the manufacturer.

### **4.5.12.7. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References.**

- GACAR Parts 21, 25, 29, 43, 91, and 121 and 135
- RTCA DO-178A, Software Considerations in Airborne Systems and Equipment Certification

#### **B. Forms.** GACA Activity Report (GAR).

#### **C. Job Aids.** None.

### **4.5.12.9. PROCEDURES.**

**A. Review the Operator's Manual.** Review applicable manuals, including the operator's maintenance manual, to ensure the following:

- 1) The manufacturer's service bulletin describing the change is GACA approved.
- 2) The manufacturer's recommended Automatic Test Equipment (ATE)/approved equivalent/manual test equipment and test data are current and capable of performing the required tests.
- 3) Procedures are described for transferring the software from the medium provided by the manufacturer to the line replaceable unit memory devices.
- 4) Procedures are described for checks ensuring that no errors are introduced by the transfer when memory devices are reprogrammed.
- 5) The manual clearly states that avionics software changes performing functions that affect the safe operation of the aircraft will be limited to the following:

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- Those described in the avionics manufacturer's GACA-approved service bulletins
  - Those for which the operator has obtained GACA approval
- 6) Controls exist to prevent unauthorized software changes and that changes are performed in accordance with the procedures described therein.
- 7) Any change to software is reflected in an appropriate revision to the identification of the line replaceable unit in accordance with the criteria of RTCA Document No. DO-178A.

**B. Review the Training Records.** Ensure that the operator's training records list those persons:

- Trained in the procedures, tools, and testing necessary to incorporate the new software
- Qualified to make the inspections when the work is completed and the units are returned to service

**NOTE:** Factory training may be necessary before using new procedures and tools to incorporate software, depending on the complexity of the tasks involved.

**C. Approve Operator Designed Software Changes Requiring GACA Engineering Assistance.**

- 1) For changes that affect aircraft safety, contact the appropriate GACA Airworthiness Engineering Section and request engineering review and approval of the verification and validation methods to be used by the operator during the design and test of the new software.
- 2) For changes that do not affect aircraft safety in a system which has been partitioned, accomplish the following:
  - Contact the GACA Airworthiness Engineering Section and request verification to confirm that partitioning exists
  - Ensure that the software changes will not affect the functions which affect aircraft safety

### 4.5.12.11. TASK OUTCOMES.

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**A. GAR.** Close the GAR.

**B. Task Completion.** Completion of this task will result in coordinating the approval or the denial of the proposed change with GACA Airworthiness Engineering.

**4.5.12.13. FUTURE ACTIVITIES.** None.

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## VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION

### CHAPTER 5. AIRWORTHINESS FOR PARTS 121 AND 135

#### Section 13. Review an Operator's Mechanical Interruption Summary Report for Parts 121 and 135

##### 4.5.13.1. GACA ACTIVITY REPORT (GAR).

A. 3322 (AW)

**4.5.13.3. OBJECTIVE.** This section provides guidance for monitoring an operator's fleet performance by tracking mechanical irregularities that occur during scheduled operations.

**4.5.13.5. GENERAL.** Operators are required by the General Authority of Civil Aviation Regulations (GACAR) §§ 121.1557 and 135.697, to submit a monthly Mechanical Interruption Summary Report (MISR). This report enables the aviation safety inspector (Inspector) to evaluate the effectiveness of the operator's maintenance programs and procedures.

##### A. Requirement for Reporting Mechanical Irregularities.

- 1) GACAR §§ 121.1541 and 135.693 require each operator to provide an aircraft maintenance log for recording or deferring mechanical irregularities, as applicable, and the subsequent corrective actions performed. This log must be carried on board each aircraft.
- 2) The operator's manual should provide a method where the pilot in command (PIC) will inform the operator of mechanical irregularities or defects that appear before, during, and after a flight. The operator uses this information to let the maintenance personnel know of any suspected problems so that corrective action can be taken. This method of reporting is the basis for the required MISR.

**B. Role of the Inspector.** Following receipt of an operator's MISR, the Inspector must evaluate the information for problem areas and significant trends. If a problem area or trend is evident, the Inspector must decide on a course of action to investigate and/or correct the problem as necessary.

**C. Obtaining Additional Information.** The Inspector may need to obtain more information than

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that available on the MISR. Possible sources of information include:

- Contact with the operator
- Research of previous MISR and inspection reports
- Investigation of the operator's recent surveillance history for related findings

**D. Analysis and Findings.** Once the Inspector has gathered the necessary data, he must analyze the findings to define the cause of the problem and determine a course of corrective action. Possible actions include:

- Requesting the operator to file a Service Difficulty Report (SDR) (GACAR §§ 121.1553 or 135.695)
- Requesting that the operator make changes to their maintenance schedules or programs
- Inspecting aircraft, facilities, or products to ensure they meet minimum standards
- Investigating for possible regulatory noncompliance
- Recommending procedural changes to the operator's manual(s)
- Identify deficiencies utilizing Volume 13, Compliance Enforcement & Resolution of Identified Safety Deficiencies

### 4.5.13.7. PREREQUISITES AND COORDINATION REQUIREMENTS.

#### A. Prerequisites:

- Knowledge of the regulatory requirements of Parts 121 and 135, as applicable
- Familiarity with the operator's maintenance program, procedures and manual

**B. Coordination.** This task may require coordination with other Inspectors (Airworthiness).

### 4.5.13.9. PROCEDURES.

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**A. Analyze the Content of Report. Review the MISR.**

- 1) Coordinate with the appropriate specialty for analysis.
- 2) Determine if any item on the MISR requires further action.

**B. Conduct Research.** To determine the course of action and the severity of the problem, accomplish the following, as necessary:

- 1) Contact the operator for additional information to help establish the following:
  - Were proper maintenance procedures followed?
  - Have appropriate corrective actions been taken?
- 2) Review previous MISRs to detect trends or irregularities that may indicate problem areas in maintenance procedures, operational procedures, or the operator's training.
- 3) Review previous inspection reports, correspondence, and other documents in the office files to determine if problem areas that relate to MISRs have been identified.
- 4) Examine operator's recent enforcement history to determine if there are any related violation actions.

**C. Analyze Findings.** Based on information obtained, determine an appropriate course of action.

**D. Debrief Operator.** Discuss with the operator all significant items identified on the MISR. Discuss corrective actions and, if necessary, inform the operator that a letter will follow to confirm the items discussed.

**4.5.13.11. TASK OUTCOMES.**

**A. Complete the GAR.**

**B. Complete the Task.** Completion of the task may result in the following:

- A formal letter to the operator confirming the results of the analysis

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- A change in the operator's maintenance program, procedures or manuals
- Compliance enforcement in accordance with Volume 13

**C. Document the Task.** File the MISR in the operator's file.

**4.5.13.13. FUTURE ACTIVITIES.** Follow up inspections to ensure compliance, as required.

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### **VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 6. PART 133 ADMINISTRATION**

##### **Section 1. Evaluate a Part 133 Operator**

###### **4.6.1.1. GACA ACTIVITY REPORT (GAR).**

A. 1385 (OP)

B. 3392 (AW)

**4.6.1.3. GENERAL.** This chapter addresses the evaluation of a General Authority of Civil Aviation Regulation (GACAR) Part 133 aerial work operators, to include: aircraft operations in which an aircraft is used for specialized services such as (but not limited to) the dispersal of products, remote sensing, survey, aerial photography, the towing of objects, and the carriage of external loads. Section 1 contains general information utilized by all aerial work operators, to include: amending the Aerial Work Operator Certificate (AWOC), contents of the Operations Specifications (OpSpecs), the Operations Manual (OM), maintenance requirements, flight crew member training requirements, operational control, flight release, transportation of dangerous goods (TDG), flight operations, etc. Section 2 addresses the evaluation of a Standard Operating Procedures (SOP). Section 3 addresses the evaluation a Part 133 Congested Area Plan (CAP). Section 4 addresses the evaluation of a Rotorcraft-Load Combination Flight Manual (RLCFM). Section 5 addresses the evaluation of a Chief Pilot and/or Operations Manager.

**NOTE:** Certification guidance for a Part 133 Aerial Work Operator can be found in Volume 3, Chapter 5, The Certification Process for Part 133.

**4.6.1.5. AERIAL WORK OPERATOR CERTIFICATE (AWOC).** Under GACAR Part 13, the President may amend, suspend or revoke any certificate in the interest of aviation safety. In addition, the operator may apply for the amendment to their certificate and/or OpSpecs.

###### **A. Amending an AWOC and/or OpSpecs.**

1) Amendments may be made (but are not limited) to any of the following:

- *OpSpecs*: additional authorization or no longer qualified for authorization

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- *Operations Manual*: a change in procedures
  - *Air Work Operator Certificate*: add or delete authorizations
  - *Training program*: a change in equipment or type of operations
- 2) When the operator applies for an amendment, the following procedure applies:

- The operator must file an application to amend its certificate with the GACA at least 15 days before the date proposed by the applicant for the amendment to become effective (unless the GACA approves filing within a shorter period)
  - The application must be submitted in the form and manner prescribed by the President
- 3) The Aviation Safety Inspector (Inspector) determines if the amendment requires any additional inspections and/or tests.
- 4) Upon approval of the amendment, the GACA will issue changes to the AWOC and/or OpSpecs, as appropriate.

**B. Renewal of a Certificate.** Unless sooner surrendered, suspended, or revoked, or an expiration date is otherwise established by the President, the expiration date of an AWOC is 24 months after the month in which it is issued or renewed. Application for renewal of an AWOC must be made on the applicable GACA form. The operator should apply for renewal at least 90 days before expiration of the certificate.

- 1) Application for renewal of a certificate will be submitted and processed in the same manner as for original issuance.
- 2) Inspectors should compare the renewal application with the expiring certificate. If no substantial changes are noted and the operator has a good record of compliance, Inspectors may issue a new certificate without conducting a comprehensive inspection. Should the renewal application show new aircraft/rotorcraft, the Inspector should check the aircraft records for compliance with the airworthiness requirements of Part 133 before the certificate is renewed.

**C. Cancellation of a Certificate.** The AWOC may be amended, suspended, or revoked for the

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same reasons that would have been cause for denying application of the original certificate. An operator may elect to voluntarily discontinue operations. The operator must voluntarily surrender the operating certificate by letter. The letter should state that the operator understands that all initial certification requirements will have to be met in order to reapply.

**4.6.1.7. OPERATIONS SPECIFICATIONS (OpSpecs) CONTENT.** Each operator must obtain OpSpecs containing all of the following:

- The specific location of the operator's principal base of operations in the Kingdom of Saudi Arabia (KSA) and, if different, the address that will serve as the primary point of contact for correspondence between the GACA and the operator
- Type of aircraft, registration markings, and serial numbers of each aircraft authorized for use
- The authorizations, limitations, and certain procedures under which each type of aerial operation, if applicable, is to be conducted
- Certain other procedures under which type of aerial work operation or class of aircraft is to be operated
- Any authorized exemption or special authority granted from any requirement
- An authorization permitting or a prohibition against, accepting, handling, and transporting of dangerous goods by air under GACAR Part 109
- Any other item the President determines is necessary

**4.6.1.9. OPERATIONS MANUAL (OM).**

**A. Operations Manual Requirements.** Each operator must prepare and maintain an Operations Manual, identifying their procedures and policies for use by flight and ground personnel. The operator must ensure that the following requirements are satisfied:

- 1) The design of the manual must incorporate human factors principles.
- 2) The policies and procedures contained in the manual must not be contrary to any applicable GACAR.

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3) Each operator must maintain at least one copy of the manual at its principal base of operations in the KSA.

4) A copy of the manual or sections (and changes and additions) must be made available to maintenance and ground operations personnel by the operator and furnished to:

- Its flight crew members; and
- GACA Inspectors assigned to the operator

5) Each employee of the operator who receives a manual must keep it up to date with the changes and additions furnished to them.

6) Applicable parts of the manual must be carried in each aircraft when away from the principal operations base of operation (except as provided in GACAR § 133.109(f))

**NOTE:** A deviation from the manual requirements may be authorized by the GACA based on the limited size of an operation.

**B. Operations Manual Contents.** Each manual must have the date of the most recent revision on each revised page.

1) The operations manual must include:

- SOP developed in accordance with GACAR § 133.141
- The name of each management person required under Subpart C of Part 133 who is authorized to act for the operator
- A description of the operational control system required under GACAR § 133.143
- Procedures for ensuring compliance with aircraft mass and balance limitations
- Copies of the operator's OpSpecs or appropriate extracted information, including aircraft authorized, crew complements, and types of operations authorized
- Procedures for complying with accident notification requirements

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- Procedures for refueling aircraft, eliminating fuel contamination, protecting from fire (including electrostatic protection), and supervising and protecting personnel during refueling
- Procedures to be followed by the PIC in the briefing under GACAR § 133.145
- Flight locating procedures (when applicable)
- Procedures for ensuring compliance with emergency procedures, including a list of the functions assigned each category of required crewmembers in connection with an emergency
- The operator's transportation of dangerous goods policies and whether the operator is authorized to carry, or is prohibited from transporting dangerous goods by air

### 2) Maintenance control procedures, including the following:

- A description of the administrative arrangements between the operator and any contract maintenance provider(s)
- A reference to the inspection program required by 133.109
- A description of the procedures for making entries in the aircraft maintenance log in accordance with GACAR § 133.179
- A description of the methods used for the completion and retention of the operator's maintenance records required by GACAR § 91.457
- A description of the procedures for implementing action resulting from mandatory continuing airworthiness information
- A description of the system of analysis and continued monitoring of the performance and efficiency of the inspection program, in order to correct any deficiency in that program
- A description of the aircraft to which the manual applies

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- Procedures for ensuring that the PIC knows that required airworthiness inspections have been made and that the aircraft has been approved for return to service in compliance with applicable maintenance requirements
- Procedures for reporting and recording mechanical irregularities that come to the attention of the PIC before, during, and after completion of a flight
- Procedures to be followed by the PIC for determining that mechanical irregularities or defects reported for previous flights have been corrected or that correction has been deferred
- Procedures to be followed by the PIC to obtain maintenance, preventive maintenance, and servicing of the aircraft at a place where previous arrangements have not been made by the operator, when the pilot is authorized to so act for the operator
- Procedures to be followed by a pilot to perform maintenance, preventive maintenance, and servicing of the aircraft at a place where previous arrangements have not been made by the operator, when the pilot is authorized to so act for the operator in accordance with GACAR § 43.5(h)
- Procedures for the release, or continuation of, a flight if any item of equipment required for the particular type of operation becomes inoperative or unserviceable en route

**4.6.1.11. SPECIAL MANUAL CONSIDERATIONS FOR ROTORCRAFT EXTERNAL-LOAD OPERATIONS.** Specific manual contents are described in Section 4, Evaluate a Rotorcraft-Load Combination Flight Manual (RLCFM), in this chapter.

**4.6.1.13. SPECIAL MANUAL CONSIDERATIONS FOR BANNER TOWING OPERATIONS.** The Operations Manual must include a section on banner towing operations.

A. The manual content for each aircraft and towing apparatus configuration to be used must contain the following:

- The maximum load that can be applied to the tow hook
- The maximum size of a banner that can be towed

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- Aircraft mass restrictions associated with towing, if any
- Maneuver limitations, if any
- Any additional equipment required, such as temperature gauges or mirrors
- Types of operation and occupancy restrictions, such as the carriage of passengers
- Any changes to the aircraft stall speeds
- Instructions and observations regarding the impact of the towed load on the performance of the aircraft
- Recommended normal and emergency procedures associated with towing operations, including:
  - o The recommended operating speeds, power settings, and preflight inspection of the towline assembly
  - o Any special notes, cautions, and warnings associated with the operations

**4.6.1.15. RECENCY OF OPERATION.** Operators must conduct an operation authorized by their OpSpecs within the preceding 180 consecutive days, unless:

**A.** If an operator *does not* conduct a type of operation within 180 days: before resuming that type of operation, the operator *must*:

- 1) Notify GACA at least 5 working days before resuming that type of operation and
- 2) Allow the GACA to conduct a full inspection and examination.

**B.** Paragraph A above *does not* apply to an operator conducting aerial work operations within 180 days of the date of original issuance of its AWOC.

**C.** If an operator *does not* conduct a type of operation within 180 days, the President may suspend or revoke the operator's AWOC.

## **4.6.1.17. FLIGHT CREW MEMBERS.**

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**A. Requirements.** All flight crew members must hold an appropriate, current flight crew member certificate issued or accepted by the GACA. In addition, each flight crew member must have any required appropriate current flight crew member and medical certificates in their possession while engaged in aerial work operations and meet the training and experience requirements of GACA Part 133 for the type of operation they are conducting. Each airman must present their certificates for inspection upon the request of the GACA.

**B. Flight Crew Member Fatigue Management.** Each flight crew member must be relieved from all duty for at least 8 consecutive hours during any 24-hour period. Operators have the option of either comply with the duty period limitations or implement a comprehensive fatigue risk management system (FRMS) that provides an equivalent level of safety to the duty period limitations. Each FRMS must comply with all of the applicable requirements for an FRMS as prescribed in GACAR Part 5, and it must be approved by the President.

**NOTE:** The Knowledge and Skills Tests required by GACAR Part 133 may be found in Volume 3, Chapter 5, The Certification Process for Part 133.

### 4.6.1.19. FLIGHT OPERATIONS.

**A. Operational Control.** Each operator must have an operational control system overseen by an Operations Manager. The operator must include a description of the operational control system in the Operations Manual (OM). In addition, each operator must ensure that all operations personnel are properly instructed about their duties and about the relationship of their duties to the operation as a whole. Operational personnel involved in aerial work must be briefed on operational procedures associated with the specific task before each flight or series of flights.

**B. Flight Release.** No flight or series of flights may be started without:

- Authority from the Operations Manager
- The Pilot-In-Command (PIC) or the Operations Manager executing a flight release

**NOTE:** The PIC may sign the flight release only when both the PIC and Operations Manager believe the flight (or series of flights) can be made safely, unless the PIC is authorized by the operator to exercise operational control and execute the flight release without the approval of any other person.

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**C. Flight Release Forms.** Inspectors should ensure the flight releases contain at least the following information concerning each flight:

- Company or organization name
- Make, model, and registration number of the aircraft being used
- Date of flight or series of flights
- Name and duty assignment of each crewmember or other person on board
- Departure aerodrome, destination aerodromes, alternate aerodromes, and route
- Minimum fuel supply (in liters or kilograms)
- A statement of the type of operation (such as, instrument flight rules (IFR), visual flight rules (VFR)) and type of aerial work operation
- The signature of the PIC or other means of certifying acceptance

**D. Low Altitude Operation.** Each operator conducting airplane operations requiring flight, other than takeoff and landing, at a height of less than 500 ft. (150 m) above the surface, must:

- Establish operational procedures to minimize the consequences of an engine failure
- Include training of the procedures in the applicable aerial work operator training program
- Ensure that all occupants are briefed on the procedures to be carried out in the event of a forced landing
- Ensure that all occupants wear appropriate protective equipment

**E. Low Altitude Operation Over Other Than Congested Areas.** Notwithstanding GACAR Part 91, during an aerial work operation, including approaches, departures, and turnarounds reasonably necessary for the operation, an operator may operate an aircraft over other than congested areas below 500 ft. (150 m) above the surface and closer than 150 m (500 ft.) to persons, vessels, vehicles, and structures, if the operations are conducted without creating a hazard to persons or property on the surface.

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**NOTE:** For guidance on approving an operation over a congested area, see Section 3, Evaluate a Part 133 Congested Area Plan (CAP).

**F. Carriage of Persons.** Part 133 does not provide for “passenger carrying” operations, but does provide for the “carriage of persons” in accordance with § 133.149. No Class A, B, or C external-load operator may allow a person to be carried during external-load operations unless that person is a flight crew member, is a flight crew member trainee, performs an essential function in connection with the external-load operation, or is necessary to accomplish the work activity directly associated with the operation.

1) A Class D rotorcraft load combination is the only external-load class permitting the carriage of persons other than crew members or persons essential to the external-load operation. An example of a person who would have to be carried as a Class D external-load is a harbor pilot being transported from land to a ship in a personnel lifting device. A Class D external-load operation can be conducted only in accordance with the following:

- The rotorcraft used must have been type certificated under GACAR Parts 27 or 29, Category A, for its operating mass. With one engine inoperative, it must be able to hover at that operating mass, and in the density altitude conditions that exist when a Class D load is carried.
- The rotorcraft must be equipped for direct radio intercommunication among required crewmembers.
- The personnel lifting device must be GACA-approved, and have an emergency release that requires two distinct actions to achieve release. For example, a emergency release device may have a pressure cartridge cable cutter with one guarded switch that requires the pilot to raise the guard before activating the switch. The guard must prevent the pilot from activating the switch inadvertently.

**G. Emergency Operations.** In an emergency involving the safety of persons or property, the operator may deviate from the rules of GACAR Part 133 to the extent required to meet that emergency. The test to determine whether a deviation is necessary is the availability of alternate means of solving the situation.

1) Rescue of property must be clearly in the public interest in order to warrant deviation

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from the operating rules and related requirements.

2) The GACA should request a complete report for each deviation from GACAR Part 133. This may be necessary to determine whether there has been a violation of the rule. The report should give a thorough, detailed account of the operation, a description of the act of deviation, and a justification for the deviation. The report must be filed within 10 days of the request by the GACA.

**H. Special Flight Operations Authorizations and Waivers.** No person may engage in any special flight operation defined in Subpart D of GACAR Part 91 without an authorization or waiver issued in accordance with Part 91.

**I. Operations with Doors Opened or Removed.** Crew members other than flight crew must be restrained when carrying out aerial work tasks with doors opened or removed.

**J. Carriage and Use of Weapons.** An operator may carry weapons on a flight for aerial work provided the weapons are secured when carried and the operator ensures that the aircraft and persons on board and on the ground are not endangered when the weapons are used.

**4.6.1.21. SPECIAL OPERATIONAL CONSIDERATIONS FOR AERIAL APPLICATION OPERATIONS.** The following additional provisions and requirements are applicable to the conduct of aerial application operations:

**A.** No person may dispense or cause to be dispensed from an aircraft, any economic poison:

- For a use other than that for which it is intended
- Contrary to any safety instructions or use limitations on its label
- In violation of any law or regulation of the KSA

**B.** Notwithstanding GACAR Part 91, pilots conducting aerial application operations may deviate from aerodrome traffic patterns with the authorization of the control tower. At aerodromes without control towers, the pilot may deviate from the traffic pattern if:

- Prior coordination is made with the aerodrome management concerned

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- Deviations are limited to the aerial application operation
- Except in an emergency, landing and takeoffs are not made on ramps, taxiways, or other areas of the aerodrome not intended for such use
- The aircraft at all times remains clear of, and gives way to, aircraft conforming to the traffic pattern for the aerodrome

**C.** Notwithstanding GACAR Part 91, an aircraft may be operated without position lights if prominent unlighted objects are visible for at least 1 SM (1600 m) and takeoffs and landings at:

- Aerodromes with a functioning control tower are made only as authorized by the control tower operator
- Other aerodromes are made only with the permission of the aerodrome management and no other aircraft operations requiring position lights are in progress at that aerodrome

### **4.6.1.23. SPECIAL OPERATIONAL CONSIDERATIONS FOR ROTORCRAFT**

**EXTERNAL-LOAD OPERATIONS.** The following additional provisions and requirements are applicable to the conduct of rotorcraft external-load operations:

**A.** Before a person may operate a rotorcraft with an external-load configuration that differs substantially from any that person has previously carried with that type of rotorcraft (whether or not the rotorcraft-load combination is of the same class), that person must conduct, in a manner that will not endanger persons or property on the surface, such of the following flight-operational checks as the President determines are appropriate to the rotorcraft-load combination:

- A determination that the mass of the rotorcraft-load combination and the location of its center of gravity are within approved limits, that the external load is securely fastened, and that the external load does not interfere with devices provided for its emergency release
- Make an initial liftoff and verify that controllability is satisfactory
- While hovering, verify that directional control is adequate

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- Accelerate into forward flight to verify that no attitude (whether of the rotorcraft or of the external load) is encountered in which the rotorcraft is uncontrollable or which is otherwise hazardous
- In forward flight, check for hazardous oscillations of the external load, but if the external load is not visible to the pilot, other crewmembers or ground personnel may make this check and signal the pilot
- Increase the forward airspeed and determine an operational airspeed at which no hazardous oscillation or hazardous aerodynamic turbulence is encountered

**B. Instrument Flight Rules (IFR).** No operator may conduct rotorcraft external-load operations under IFR unless specifically authorized by the GACA. However, under no circumstances may a person be carried as part of the external-load under IFR.

**C. Low Altitude Operations.** Each operator conducting operations with rotorcraft which, in the event of a critical power unit failure, are not able to sustain flight or perform a safe forced landing, must:

- Establish operational procedures to minimize the consequences of a power unit failure
- Include training of the procedures in the applicable aerial work operator training program
- Ensure that all occupants are briefed on the procedures to be carried out in the event of a forced landing
- Ensure that the rotorcraft is equipped with appropriate crash mitigation equipment pertinent to the operation
- Ensure that all occupants wear appropriate protective equipment

**NOTE:** See GACAR Part 1 for definitions of the specific rotorcraft external-load classes.

### **4.6.1.25. SPECIAL OPERATIONAL CONSIDERATIONS FOR BANNER TOWING**

**OPERATIONS.** The following additional provisions and requirements are applicable to the conduct of banner towing operations:

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**A.** Inspection procedures and the service lives of towing installation components, including towlines, must be in accordance with manufacturers' instructions. Where such instructions are not available:

- The towrope and safety link must be inspected at the start of every flying day and if broken strands are found, the rope must be replaced before conducting any flight operation.  
Damaged thimbles and deformed rings must be replaced before conducting any flight operation.
- The tow hook release mechanism must be inspected daily, when in use, for wear and proper operation

**B.** Operations must not be conducted over an open-air assembly of persons.

**C.** Operations must begin and end in an area of the aerodrome that is free from use by the public and located away from active taxiways and runways. The pickup and drop area must have a clear approach path that allows for safe operation.

**D.** Operations must be limited to day VFR only operations.

**E.** If a ground crew is used, a prearranged communication signal must be established so the ground crew can notify the pilot and/or banner tow operator of problems or malfunctions with the equipment or banner.

**4.6.1.27. RECORDS AND REPORTS.** Each operator must maintain the records required by Part 133 at its principal operations base in the KSA, or at another location used by it and approved by the President.

**NOTE:** Electronic signature systems may be used if approved by the President with OpSpec A25.

**A. Crew Member Records.** Operators must:

- Maintain current records of each crew member that show whether or not that crewmember complies with the GACARs (such as, proficiency checks, aircraft qualifications, test results, any required physical examinations, and flight time records)

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- Record each action taken concerning the release from employment or physical or professional disqualification of any flight crew member and keep the record for at least 6 months

**B. Training and Qualification Records.** Each operator must keep the following records for each person who is required to receive training:

- The person's name and airman certificate number, type and ratings (if applicable)
- The person's medical category and the expiration date of that category (if applicable)
- The dates on which the person, (while employed by the operator), successfully completed any required training or obtained any required qualification
- Information relating to any failure of the person (while employed by the operator), to successfully complete any required training or to obtain any required qualification
- The type of aircraft or flight training equipment used for any training, or qualification required under this part

**NOTE:** The above record requirements must be kept for a minimum of 3 years.

**C. Disposition of the Flight Release.** The PIC of an aircraft must carry the original (or a signed copy of the flight release) in the aircraft during the flight or series of flights. After the flights are completed, the operator must retain either the original or a copy of the flight release at its principal operations base in the KSA for at least 30 days.

**D. Aircraft Maintenance Logs.** Each operator must establish a procedure for keeping copies of the aircraft maintenance log required by Part 133 in the aircraft and must include that procedure in its Standard Operating Procedures (SOP).

### 4.6.1.29. AIRCRAFT MAINTENANCE.

**A. Operator's Responsibilities .** Aerial work operators are primarily responsible for:

- Aircraft airworthiness

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- The scheduling and performance of maintenance, preventive maintenance and alterations
- The scheduling and performance of inspections required by GACAR Parts 91 or 133 (as applicable)
- Ensuring that maintenance personnel make entries in the aircraft maintenance log and maintenance records which meet the requirements of GACAR Part 43 and the operator's Operations Manual (OM), and which indicate that the airplane has been approved for return to service after maintenance, preventive maintenance, or alteration has been performed
- Ensuring that each person with whom they arrange maintenance, has an organization adequate to perform the work

### **B. Required Maintenance.** Operators may not operate an aircraft unless:

- The replacement times for life-limited parts specified in the instructions for continued airworthiness produced in accordance with GACAR Part 21 are complied with
- Defects disclosed between inspections, or as a result of inspection, have been corrected in accordance with GACAR Part 43
- The aircraft, including airframe, aircraft engines, propellers, appliances, emergency equipment, and their component parts, is inspected in accordance with the aircraft inspection requirements of GACAR Part 91, unless an aircraft inspection program has been required or approved by the President in accordance with GACAR § 133.109
- The installed engines have been maintained in accordance with the overhaul periods recommended by the manufacturer, unless other overhaul periods have been authorized by the President

### **C. Aircraft Inspection Program.**

- 1) If the aircraft inspections required (or allowed) under GACAR Part 91 are not adequate, the operator's OpSpecs may be amended to require or allow an approved aircraft inspection program for any make and model aircraft.
  - 2) An operator who applies for an amendment of its OpSpecs for an approved aircraft
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inspection program must submit that program for approval to GACA, at least 30 days prior to inclusion in the OpSpecs.

3) The aircraft inspection program submitted for approval must contain the following:

- Instructions and procedures for the conduct of aircraft inspections (which must include necessary tests and checks), setting forth in detail the parts and areas of the airframe, engines, propellers, rotors, and appliances, including emergency equipment, that must be inspected
- A schedule for the performance of the aircraft inspections in terms of the time in service, calendar time, number of system operations, or any combination of these
- Instructions and procedures for recording discrepancies found during inspections and correction or deferral of discrepancies including form and disposition of records

4) After approval, the operator must include the approved aircraft inspection program in the Operations Manual.

5) If an aircraft inspection or maintenance is conducted at a station where the approved inspection program manual is located, the operator is not required to carry the inspection program manual aboard aircraft en route to those stations.

6) Whenever the GACA finds that revisions to an approved aircraft inspection program are necessary, the operator must make changes to the program. The operator may petition the GACA to reconsider the notice to make any changes in a program. The petition must be filed with the GACA within 30 days after the operator receives the notice.

7) Each operator must have each aircraft that is subject to the program inspected in accordance with the program.

8) The registration number of each aircraft must be included in the OpSpecs.

9) No person may perform inspections unless they are authorized to perform maintenance under GACAR Part 43.

### **4.6.1.31. TRANSPORTATION OF DANGEROUS GOODS (TDG).** The operator's transportation of

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dangerous goods policies and whether the operator is authorized to carry, or is prohibited from transporting dangerous goods by air, must be included in the operators Operations Manual. In addition, all operators must have an authorization in their OpSpecs to either:

- Transport dangerous goods
- A prohibition against transporting or handling of dangerous goods

### A. General.

- 1) The transport of dangerous goods by air must be conducted in accordance with GACAR Part 109.
- 2) Except as provided for in GACAR § 109.7, an operator must not transport dangerous goods unless authorized to do so by the President in accordance with GACAR § 109.5.
- 3) All reasonable measures must be taken to prevent dangerous goods from being carried on board inadvertently.
- 4) The operator must, in accordance with the GACAR § 109.121, report without delay to the President where the accident or incident occurred:
  - Any incidents or accidents involving dangerous goods
  - The finding of undeclared or wrongfully declared dangerous goods discovered in cargo or passengers' baggage
- 5) Operators must not fly over congested areas of cities, towns, or settlements or over an open air assembly of persons when applying or using dangerous goods for aerial work.
- 6) No operator may dispense (or cause to be dispensed) any material or substance that creates a hazard to persons or property on the surface.

### B. Dangerous Goods Training Program.

Each operator must establish and implement a dangerous goods training program that:

- 1) Satisfies the applicable requirements of GACAR § 109.101.

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2) Ensures that each person performing or directly supervising any of the job functions listed below is trained to comply with all applicable parts of GACAR Part 109:

- Acceptance
- Rejection
- Handling
- Storage incidental to transport
- Packaging of company material
- Loading

4) Contains procedures and information to assist personnel (particularly maintenance, shipping, and stores personnel) to identify or recognize aircraft components and consumable materials that contain dangerous goods regulated by GACAR Part 109.

5) Contains information, instructions, and detailed procedures for the proper disposal of unserviceable aircraft components and consumable materials containing hazmat.

6) Each operator's dangerous goods training program must be approved by the President prior to implementation.

### **4.6.1.33. AIRCRAFT AND EQUIPMENT.**

**A. Aircraft.** No operator may operate an aircraft under Part 133 unless that aircraft:

- Is registered as a civil aircraft of the KSA and carries an appropriate and current airworthiness certificate issued under GACAR Part 21
- Is in an airworthy condition and meets the applicable airworthiness requirements, including those relating to identification and equipment
- All special equipment installed for the aerial work operation has been approved under GACAR Part 21

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**NOTE:** Foreign registered aircraft may be used provided they have a valid airworthiness certificate issued by an ICAO contracting state and the President is satisfied that the aircraft is safe for the intended operations.

**B. Emergency Egress from the Flightdeck.** Aircraft must be equipped with effective means of breaking out of the flightdeck.

**C. Occupant Restraint Devices: Operations with Doors Opened or Removed.** Aircraft must be equipped with effective occupant restraint devices when carrying out aerial work tasks with doors opened or removed.

**D. Inoperable Instruments and Equipment.** No operator may operate an aircraft with inoperable instruments or equipment installed unless the following conditions are met:

- An approved Minimum Equipment List (MEL) meeting the requirements of GACAR § 91.309 exists for that aircraft and the operator's operations specifications authorize use of an approved MEL for an aircraft
- Instruments and equipment required for specific operations by this part must not be included in the MEL
- An aircraft with inoperable instruments or equipment may be operated under a special flight permit under GACAR §§ 21.179 and 21.181 or for foreign registered aircraft under GACAR § 91.309

**E. Individual Protective Equipment.** Persons on board must be provided with and wear personal protective equipment which is adequate for the type of operation.

### **4.6.1.35. SPECIAL AIRCRAFT AND EQUIPMENT CONSIDERATIONS FOR ROTORCRAFT EXTERNAL-LOAD OPERATIONS.**

**A. Each external-load attaching means must have been approved under:**

- GACAR Part 27 or 29, as applicable *or*
- GACAR § 21.33

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**B.** Each quick release device must have been approved under GACAR Part 21 and the device must comply with GACAR §§ 27.865(b) and 29.865(b), as applicable.

**C.** Mass and center of gravity:

1) The total mass of the rotorcraft-load combination must not exceed the total mass approved for the rotorcraft during its type certification.

2) The location of the center of gravity must, for all loading conditions, be within the range established for the rotorcraft during its type certification. For Class C rotorcraft-load combinations, the magnitude and direction of the loading force must be established at those values for which the effective location of the center of gravity remains within its established range.

**D.** The operator must establish safe operating practices, perform operational flight checks listed below (as applicable), ensuring that the rotorcraft-load combination has satisfactory flight characteristics (unless these operational flight checks have been demonstrated previously and the rotorcraft-load combination flight characteristics were satisfactory). For the purposes of this demonstration, the external-load mass (including the external-load attaching means) is the maximum mass for which authorization is requested:

1) For *Class A* rotorcraft-load combinations, the operational flight check must consist of at least the following maneuvers:

- Takeoff and landing
- Demonstration of adequate directional control while hovering
- Acceleration from a hover
- Horizontal flight at airspeeds up to the maximum airspeed for which authorization is requested

2) For *Class B and D* rotorcraft-load combinations, the operational flight check must consist of at least the following maneuvers:

- Pickup of the external load

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- Demonstration of adequate directional control while hovering
- Acceleration from a hover
- Horizontal flight at airspeeds up to the maximum airspeed for which authorization is requested
- Demonstrating appropriate lifting device operation
- Maneuvering of the external load into release position and its release, under probable flight operation conditions, by means of each of the quick-release controls installed on the rotorcraft

3) For *Class C* rotorcraft-load combinations used in wire-stringing, cable-laying, or similar operations, the operational flight check must consist of the maneuvers, as applicable, prescribed in D(2) above.

**E.** The following markings and placards must be displayed conspicuously and must be such that they cannot be easily erased, disfigured, or obscured:

- A placard (displayed in the flightdeck or cabin) stating the class of rotorcraft-load combination for which the rotorcraft has been approved and the occupancy limitations
- A placard, marking, or instruction (displayed next to the external-load attaching means) stating the maximum external load prescribed as an operating limitation

### **4.6.1.37. SPECIAL PERFORMANCE CRITERIA CONSIDERATIONS FOR ROTORCRAFT EXTERNAL-LOAD OPERATIONS IN A CONGESTED HOSTILE ENVIRONMENT.**

**A.** Rotorcraft operating in a congested hostile environment must be:

- Certificated in Category A
- Operated at a mass and in conditions that, in the event of a critical power unit failure, the rotorcraft is capable of sustaining level flight. Measures must be taken to prevent risk to persons on the ground and to alleviate risk to property on the surface.

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**B.** Rotorcraft operating outside a congested hostile environment must be certificated in Category A or B.

**C.** The mass at takeoff, landing, or hover must not exceed the maximum mass specified for a hover in ground effect (HIGE) with all power units operating at the appropriate power rating. If conditions prevail that a HIGE is not likely to be established, the rotorcraft mass must not exceed the maximum mass specified for a hover out of ground effect with all power units operating at the appropriate power rating.

### **4.6.1.39. SPECIAL AIRCRAFT AND EQUIPMENT CONSIDERATIONS FOR BANNER TOWING OPERATIONS.**

**A. Towline Assembly.** The towline assembly consists of the towrope, safety link, and towrings.

- 1) The towrope must have a breaking strength of 10 times the banner mass.
- 2) The strength of the safety link must not be more than 90 percent of the strength of the towrope or 90 percent of the allowable towing force specified for the tow hook. The safety link must be installed at the point of attachment of the towrope to the tow airplane.

**B. Climb Performance.** When towing a banner with the tow airplane at its maximum approved operating mass, the minimum rate of climb must be:

- 100 ft./min (30 m/min) at 1000 ft. (300 m) above the take-off surface at the ambient temperature in which towing operations will take place or
- 300 ft./min (75 m/min) at sea level on a standard day

**C. Engine cooling.** When conducting airplane banner towing operations, one of the following requirements must be satisfied:

- The airplane must be fitted with a functioning cylinder head temperature gauge or
- The operator must demonstrate adequate cooling with the towed load

**D. Release lever.** Each aircraft used in banner towing operations must be equipped with an easily accessible lever or other control that permits the pilot to release the towed banner while in flight.

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**E. Tow hitch.** If the tow hitch is not part of an original factory installation, aircraft records must be inspected before initial operation to ensure the aircraft maintenance records describe the installation of the tow hitch.

**F. Placards.** The following markings and placards must be displayed conspicuously and must be such that they cannot be easily erased, disfigured, or obscured:

- A placard (placed in the flightdeck) stating the banner mass limitations of the tow hitch
- A placard near the airspeed indicator noting any changes to the airplane stall speeds
- A placard indicating the direction of operation of the release lever

**4.6.1.41. TASK OUTCOMES.** Completion of this task results in either:

- The approval of an amendment to the operators AWOC/OpSpecs
- A letter to the operator outlining areas of deficiency

**4.6.1.43. FUTURE ACTIVITIES.** Future activities include:

- Scheduled surveillance
- Renewal conducted every 24 calendar-months
- Possible amendment of the AWOC at the request of the operator

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### **VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 6. PART 133 ADMINISTRATION**

##### **Section 2. Evaluate Standard Operating Procedures (SOP)**

###### **4.6.2.1. GACA ACTIVITY REPORT (GAR).**

A. 1302 (OP) (Initial)

B. 1303 (OP) (Revision)

**4.6.2.3. OBJECTIVE.** The objective of this task is to ensure that an operator's Standard Operating Procedures (SOP) meet regulatory requirements and provides adequate procedures and guidance for safely conducting General Authority of Civil Aviation Regulation (GACAR) Part 133 operations.

**4.6.2.5. AUTHORITY.** Per GACAR § 133.141:

A. Before commencing operations, each operator must carry out a Risk Assessment (RA) and must develop appropriate SOPs for each kind of aerial work operation they intend to perform. The risk assessment and SOPs should address at least the following:

- Scope and complexity of the activity
- Aircraft and equipment
- Crew composition and training
- Aircraft performance
- Normal and emergency procedures
- Ground equipment
- Record keeping

B. Aerial work must be performed in accordance with the SOP.

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**C.** Operators must ensure that copies of the SOP, or pertinent portions of the SOP, are carried on board each aircraft while conducting GACAR Part 133 operations.

**D.** Applicants for an Aerial Work Operator Certificate (AWOC) must demonstrate to the President that the SOP is suitable for the intended operation.

**4.6.2.7. RISK ASSESSMENT.** SOPs should be based on a systematic risk assessment to ensure that the risks associated with the task are acceptable. The risk assessment should describe the activity in detail, identify the relevant hazards, analyze the causes and consequences of accidental events and establish methods to treat the associated risk. Figure 4.6.2.1 shows the development of a SOP based on a risk assessment. Additional Risk Assessment guidance can be found in Volume 2, Safety Management Systems-General.

**4.6.2.9. DEVELOPMENT OF A SOP.** SOPs should be developed to a standard format, taking into account the results of the risk assessment process. Using GACAR § 133.141(a) as guidance, the following areas of operations must be included in the SOP:

### **A. Scope and Complexity of the Activity.**

1) *The nature of the activity and exposure.* The nature of the flight and the risk exposure (e.g. low height) should be described.

2) *The complexity of the activity.* Detail should be provided on how demanding the activity is with regard to the required piloting skills, the crew composition, the necessary level of experience, the ground support, safety and individual protective equipment that should be provided for persons involved.

3) *The operational environment and geographical area.* The operational environment and geographical area over which the operation takes place should be described:

a) Congested Hostile Environment: Aircraft performance standard, compliance with rules of the air, mitigation of third party risk.

b) Mountain Areas: altitude, performance, the use/non-use of oxygen with mitigating procedures;

c) Sea Areas: sea state and temperature, risk of ditching, availability of search and

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rescue, survivability, carriage of safety equipment;

d) Desert Areas: carriage of safety equipment, reporting procedures, search and rescue information; and

e) Other areas.

4) *The application of risk assessment and evaluation.* The method of application of A 1) thru A 3) to the particular operation so as to minimize risk should be described. The description should reference the risk assessment and the evaluation on which the procedure is based. The SOPs should:

a) Contain elements relevant to the operational risk management performed during flight.

b) Contain limitations, where required, such as weather, altitudes, speeds, power margins, masses, landing site size.

c) List functions required to monitor the operation. Special monitoring requirements in addition to the normal functions should be described in the SOPs.

### **B. Aircraft and Equipment.**

1) *The Aircraft.* The category of aircraft to be used for the activity should be indicated (e.g. rotorcraft/airplane, single/multi-engine, classic tail rotor/Fenestron/no tail rotor (NOTAR) equipped). In particular, for rotorcraft, the necessary level of performance certification e.g. Category A, should be specified.

2) *Equipment.* All equipment required for the activity should be listed. This includes installed equipment certified in accordance with GACAR Part 21 as well as equipment approved in accordance with other officially recognized standards. A large number of activities require, in addition to the standard radio communication equipment, additional air-to-ground communication equipment. This should be listed and the operational procedure should be defined.

### **C. Crew Composition and Training.** The crew composition, including the following, should be specified:

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- minimum flight crew (according to the appropriate manual)
- additional crew and task specialists

In addition, for flight crew members, the following should be specified:

- selection criteria (initial qualification, flight experience, experience of the activity)
- initial training (volume and content of the training)
- recent experience requirement and/or recurrent training (volume and content of the training)

**NOTE:** Operational environment and the complexity of the activity should be taken into account and detailed in the training programs.

### **D. Aircraft Performance.**

This chapter of the SOP should detail the specific performance requirements to be applied, in order to ensure an adequate power margin.

### **E. Normal and Emergency Procedures.**

#### *1) Normal procedures.*

- a) Operating procedures. The operating procedures to be applied by the flight crew, including the coordination with task specialists.
- b) Ground procedures. The procedures to be applied by the task specialists should be described, e.g. loading/unloading, cargo hook operation.

#### *2) Emergency procedures.*

- a) Operating procedures. The emergency procedures to be applied by the flight crew, the coordination with the task specialist and coordination between the flight crew and task specialists should be described.
- b) Ground procedures. The emergency procedures to be applied by the task specialists

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(e.g. in the case of a forced landing) should be specified.

### **F. Ground Equipment.**

This chapter should detail the nature, number and location of ground equipment required for the activity, such as:

- Refueling facilities, dispenser and storage
- Firefighting equipment
- Size of the operating site (landing surface, loading/unloading area)
- Ground markings

**G. Record Keeping.** It should be determined which records specific to these flight(s) are to be kept, such as aircraft registration, pilot-in-command, flight times, weather and any remarks, including a record of occurrences affecting flight safety or the safety of persons or property on the ground.

**4.6.2.11. PROCEDURES.** If the SOP is for an initial aerial work operator applicant, follow the guidance found in Volume 3, Chapter 5, The Certification Process for Part 133. If this is a revision to an existing operator's SOP, review the revision and follow the guidance found in Volume 1, Chapter 4, Section 1, General Information and the Approval or Acceptance Process.

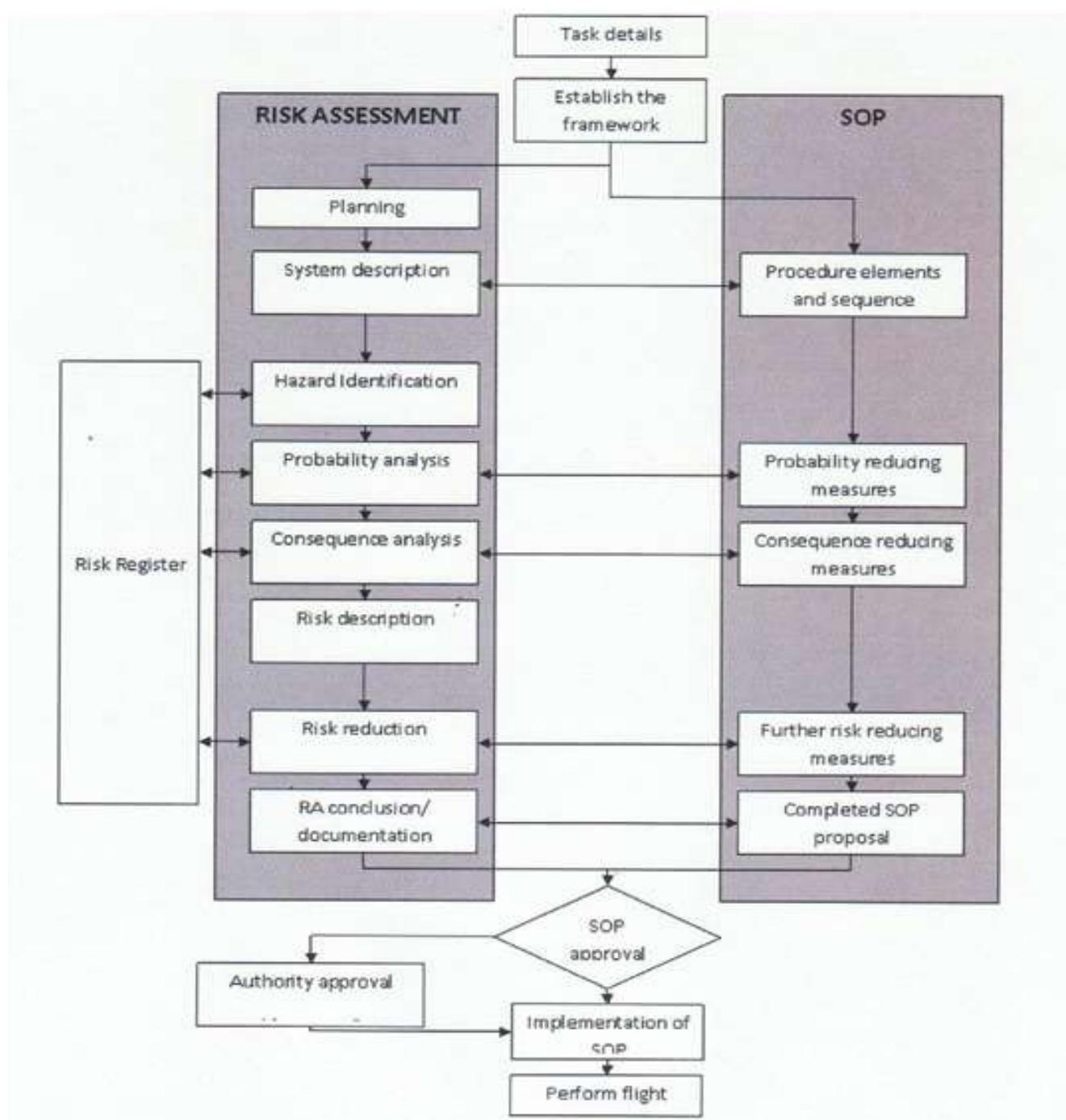
**4.6.2.13. TASK OUTCOMES.** Completion of this task results in either of the following:

- A. An approved SOP or an approved revision.
- A. A letter indicating that the SOP is not approved.

**4.6.2.15. FUTURE ACTIVITIES.** Possible review of revisions to the SOP.

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Figure 4.6.2.1. Development of a SOP Based on a Risk Assessment



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### **VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 6. PART 133 ADMINISTRATION**

##### **Section 3. Evaluate a Part 133 Congested Area Plan (CAP)**

###### **4.6.3.1. GACA ACTIVITY REPORT (GAR).**

A. 1302 (OP) (Initial)

B. 1303 (OP) (Revision)

**4.6.3.3. OBJECTIVE.** The objective of this task is to determine if a General Authority of Civil Aviation Regulation (GACAR) Part 133, Aerial Work Operator congested area plan (CAP) meets all regulatory and safety requirements.

**4.6.3.5. GENERAL.** GACAR § 133.57 permits an aerial work operator to operate an aircraft over a congested area at altitudes required for the proper accomplishment of an aerial work operation. The operation must be conducted:

- With the maximum safety to persons and property on the surface, consistent with the operation
- Notice of the intended operation must be given to the public by some effective means, such as newspapers, radio, television, or other suitable means

**NOTE:** If time allows, the public notice should be given at least 48 hours before dispensing operations begin.

- A Congested Area Plan (CAP) for each complete operation must be submitted to, and approved by the President. The plan must include consideration of obstructions to flight; the emergency landing capabilities of the aircraft to be used; and any necessary coordination with air traffic control

**A. Single Engine Aircraft.** Single engine aircraft must be operated as follows:

- 1) Except for rotorcraft, no operator may take off a loaded aircraft, or make a turnaround over a

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congested area.

- 2) No operator may operate an aircraft over a congested area below the altitudes prescribed in GACAR Part 91, except during the actual aerial work operation, including the approaches and departures necessary for that operation.
- 3) No operator may operate an aircraft over a congested area during the actual aerial work operation, including the approaches and departures for that operation, unless it is operated in a pattern and at such an altitude that the aircraft can land, in an emergency, without endangering persons or property on the surface.

### **B. Multiengine Aircraft.** Multiengine aircraft must be operated as follows:

- 1) No operator may operate a multiengine airplane at a mass greater than the mass that, with the critical engine inoperative, would permit a rate of climb of at least 50 ft./min (15 m/min) at an altitude of at least 1,000 ft. (300 m) above the elevation of the highest ground or obstruction within the area to be worked or at an altitude of 5,000 ft. (1500 m), whichever is higher.

**NOTE:** It is assumed that the propeller of the inoperative engine is in the minimum drag position; that the wing flaps and landing gear are in the most favorable positions; and that the remaining engine or engines are operating at the maximum continuous power available.

- 2) No operator may operate any multiengine aircraft over a congested area below the altitudes prescribed in GACAR Part 91 except during the actual aerial work operation, including the approaches, departures, and turnarounds necessary for that operation.

**4.6.3.7. BASIC PLAN REQUIREMENTS.** The actual content of the congested area plan (CAP) will vary with the type of operation. It is the General Authority of Civil Aviation's (GACA's) responsibility to accept/approve an operator's CAP based on the specific type of operation under which the operator approved.

### **4.6.3.9. PROCEDURES.**

**A. Initial Inquiry.** Upon inquiry, give applicant a sample CAP or explain what the plan must include.

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### **B. GAR.** Open GAR file.

**NOTE:** If the CAP is part of an initial certification, a GAR should already be open and may be used to approve the CAP.

**C. Review Submitted Plan.** An acceptable plan must include (but not be limited to) the following information:

- 1) The name, address, and phone number of operator.
- 2) The name, address, and phone number of contractor (if applicable).
- 3) The registration marks of the aircraft;
- 4) The type of aircraft (make and model) to be used.
- 5) The name of pilots involved in the congested area operation.
- 6) A description of loads to be carried including the weight of each load (if applicable).
- 7) The date the operation begins, the dates of all flights, and the date the operation ends.
- 8) The name and phone number of the person contacted at the local authorities.
- 9) The signature of person responsible for the company (usually the Operations Manager or Chief Pilot).
- 10) The date of submission.
- 11) A copy of the written agreement with local officials for the exclusion of unauthorized persons, or the name and telephone number of the official if responsibility is delegated to the operator.
- 12) A record of coordination with ATC (if applicable).
- 13) A detailed chart depicting flight routes and altitudes.
- 14) A procedure for ceasing operation if a potential or real hazard occurs.

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### D. Site Inspection.

- 1) Verify that the operational areas, including emergency landing sites, are adequate as described in the plan.
- 2) Note any discrepancies or conditions of approval.

**E. Plan Satisfactory.** When all requirements for the plan are met, approve it by stamping, dating, and signing each page. Make a copy of the plan for the GACA files.

**F. Plan Satisfactory with the Addition of Provisions.** When all requirements have been met, but the further requirements must be made in the interest of safety, approve the plan with provisions specified in writing. Make a copy of the plan and the provisions for the file.

**G. Plan Unsatisfactory.** Advise the operator that the plan is unsatisfactory and explain what the deficient areas are.

- 1) Discuss whether to return the plan or whether the operator will amend the plan.
- 2) Review resubmitted plan and re-inspect the site as necessary.

**H. GAR.** Close GAR file.

**4.6.3.11. CONDITIONS OF APPROVAL.** The aviation safety inspector (Inspector) may find it necessary to specify conditions of approval for a plan. These contingencies may be based on the Inspector's experience monitoring similar plans or experience with this operator. The Inspector may approve the plan in principle provided the operator complies with the written contingencies the Inspector notes on the plan (see Figure 4.6.3.6, Letter Approving CAP with Contingencies).

**4.6.3.13. CONGESTED AREA PLAN CONTINGENCIES.** The CAP submitted by the operator should contain contingency plans for as many variables as possible. With approved contingencies, the operator will not have to postpone the operation to seek GACA approval if the plan must be modified.

### 4.6.3.15. SPECIAL CONSIDERATIONS FOR AERIAL APPLICATION OPERATIONS.

**A. Congest Area Plan.** An aerial application operator's congested area plan should include the

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following information:

- 1) A current aerial photograph, current map, or a recently drawn diagram of the area to be worked, such as:
  - Any representation must show all obstructions which may present hazards during operation
  - Potential areas for emergency landing or dumping of agricultural materials must also be indicated
- 2) Altitudes to be maintained, approaches, departures, and turnaround considerations during operation.
- 3) Name and type of material to be dispensed.
- 4) Type of pest or work to be accomplished.
- 5) Dates and hours of dispensing operations.
- 6) Coordination with air traffic control.
- 7) Special operating procedures or limitations to ensure safe operations.
- 8) Method of public notification.
- 9) An indication of coordination with the appropriate state, local, or municipal authorities.
- 10) Methods for complying with GACAR §§ 137.57 and 133.59, to include:
  - Arrangements for blocking off streets and other areas which may be used for emergency landings
  - Observe the load jettisoning demonstration from the ground if jettisoning test data is not available or in doubt
- 11) Means for terminating the operation in the event it appears safety may be compromised, or at the Inspector's discretion.

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**B. Preventing Inadvertent Jettisoning.** Aircraft conducting agricultural operations over congested areas must have a means of preventing inadvertent jettisoning of the tank or hopper. This can be accomplished with a device such as:

- Spring-loaded cover over a pull lever
- “T” handle or pull ring in a spring loaded shield
- A push-pull device fastened with fine safety wire
- Other equivalent devices

### 4.6.3.17. SPECIAL CONSIDERATIONS FOR ROTORCRAFT OPERATIONS.

**A. Low Altitude Operations.** In addition to the requirements and limitations of Subpart D of GACAR Part 133, operators conducting operations over a congested area must satisfy the following requirements:

1) The plan required under GACAR § 133.57(b)(2) must include:

- An agreement with the appropriate local officials that unauthorized persons will be excluded from the area in which the operation will be conducted
- Coordination with air traffic control, if necessary
- A detailed chart depicting the flight routes and altitudes

2) Each flight must be conducted at an altitude, and on a route, that will allow a jettisonable external load to be released, and the rotorcraft landed, in an emergency without hazard to persons or property on the surface.

**B. Restricted Category Rotorcraft.** Per GACAR 133, Appendix B (c)(3)(iv): No person may conduct an external-load operation with a rotorcraft type certificated in the restricted category under GACAR § 21.33 over a densely populated area, in a congested airway, or near a busy aerodrome where passenger transport operations are conducted.

**C. External-Load Operations Congested Area Plan.** It is unreasonable to expect the plan or the

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Inspector to foresee every unlikely eventuality, including crash forces or scatter patterns. A rotorcraft crash that occurs during a low speed, low altitude external-load operation may produce less crash forces than another rotorcraft without an external-load that impacts with 120 knots forward speed. Consequently, both the operator and the Inspector must weigh all the alternatives and carefully make decisions that would not unduly restrict external-load operations that are clearly in the public interest. The operator is responsible for developing a plan that minimizes manageable risk. As such, the CAP should include:

- 1) *Rotorcraft Identification.* Identification of rotorcraft is used to verify that a particular rotorcraft is on the List of Authorized Rotorcraft.
- 2) *Operating Category.* Identification of rotorcraft airworthiness category is used to determine whether the operator plans to use restricted category rotorcrafts.
- NOTE:** The use of restricted category rotorcraft is not authorized over a densely populated area, in a congested airway, or near a busy aerodrome where passenger transport operations are conducted.
- 3) *Dates and Times of the Proposed Operation.* This enables the Inspector to evaluate the exclusion of unauthorized persons from the operational area by local authorities and/or the operator. It also provides the Inspector with the opportunity to schedule surveillance during the operation.
- 4) *Contact Information.* The name, phone number, and title of the official of the local political subdivision should be provided, when appropriate.
- 5) *Load Characteristics.* When evaluating the plan, the Inspector should consider the weight, shape, and aerodynamic flight characteristics of the load.
- 6) *Cable Length.* The Inspector needs to know the proposed length of cable to determine if the plan provides for an adequate operational area.
- 7) The operator should estimate how many floors the load, with attaching means, could penetrate if dropped from the highest point that it will be lifted above the building. The type of roof construction and the size, shape, and weight of the load must be taken into account. The plan should require that one additional floor beyond those estimated to be penetrable be unoccupied. On a tiered building, the height the load will be lifted above each tier will

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determine the number of floors in the respective tiers that must be unoccupied (Figure 4.6.3.1).

8) *Contact Information.* The Inspector should be provided with phone numbers to contact the building owner and/or manager for verification that the building will actually be unoccupied during the operation. Exclusion of persons includes after-hours personnel such as building maintenance workers.

9) *Maps.* Aeronautical charts alone often do not provide sufficient detail for depicting routes and altitudes over a congested area. City maps or even hand drawn charts may be necessary. Hand drawn charts should be drawn to approximate scale. Topographical maps, charts, and aerial photographs should be as current as possible to assure an accurate representation of the area.

10) *Site Photographs.* When available, photographs of the lift site, set site, and surrounding areas can also be an asset to the Inspector. If the CAP is in an area unfamiliar to the Inspector, the addition of these photographs can greatly reduce the amount of time needed to approve the CAP.

**D. Unique external-loads.** The risk to the nonparticipating public dictates operational area requirements. It must be emphasized that the following criteria are guidelines and the Inspector may exceed or reduce them as appropriate.

1) *Criteria 1, Normal Loads.* For non-aerodynamic loads, such as air conditioning units and flag poles flown below effective translational lift (ETL), the radius of the operational area should be at least 1.5 times the overall length (including rotor discs) of the rotorcraft used, or the length of the external-load including the attaching means (cable, etc.), whichever is greater. (Figure 4.6.3.2) When operating along a route above ETL, the operational area should extend at least 45 degrees in front of the rotorcraft. For example, if the rotorcraft (not load) will be operated at 100 m above the surface, the operational area should extend at least 100 m in front of the rotorcraft. The forward radius should not extend less than 3 times the overall length of the rotorcraft (Figure 4.6.3.3).

2) *Criteria 2, Aerodynamically Shaped Loads.* For aerodynamic loads, use whichever is greater: Criteria 1 (above) or Criteria 2. In Criteria 2, the criteria applied to aerodynamic loads provides for about 45 degrees of drift after the load is released. If the load is lifted 65 m high, the operational area radius should be 65 m. The method of calculation that provides for

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the greatest operational area should be used. For example, a rotorcraft will transport an aerodynamically shaped load along a congested area route. The higher the load is lifted above the surface, the wider the operational area must be to accommodate release of the load. Conversely, operating the rotorcraft at a higher altitude provides more options for landing in an emergency. Generally, the plan should provide for operating the rotorcraft at an altitude high enough to permit landing in an emergency, but hold the load low enough to ensure that the external-load will land within the operational area if it is released. (Figure 4.6.3.4)

**E. Subcontracting Work or Equipment: Responsibility for the CAP.** A situation may arise when an external-load operator contracts with another external-load operator for a specific operation. For example, operator A's rotorcraft can lift only a certain mass that is less than the mass of the load to be lifted. Operator B has a large rotorcraft that can lift the load. In this case, operator B would have to submit the CAP because operator B is actually performing the work. If operator A wishes to conduct the external load operation using operator B's rotorcraft, operator A must meet all certification requirements appropriate to adding operator B's rotorcraft to operator A's list of authorized rotorcraft.

**4.6.3.19. PILOT REQUIREMENTS.** Each pilot in command (PIC) must have:

- At least 25 hours of PIC flight time in the make and basic model of the aircraft, at least 10 hours of which must have been acquired within the preceding 12 months and
- At least 100 hours of flight experience as PIC in conducting aerial work operations of the type to be conducted

**4.6.3.21. TASK OUTCOMES.** Completion of this task results in either:

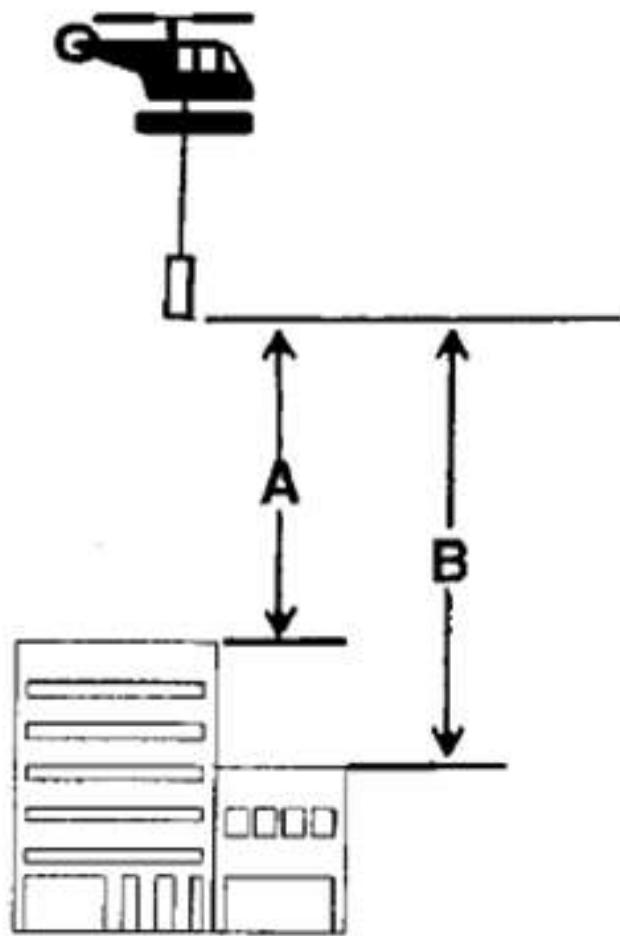
- A record in the file indicating an approved CAP, with or without contingencies; or
- A letter to the operator outlining areas of deficiency in a CAP

**4.3.6.23. FUTURE ACTIVITIES.** Ideally, each congested area plan operation should be monitored if practicable. However, an ongoing daily operation may not require continuous monitoring. An operator unfamiliar to the GACA or an operator working over a congested area for the first time should require an Inspector's presence for the duration of the operation (see Volume 12, Chapter 8, Section 3, Congested Area Operation Inspection (Operations) for Part133).

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**Figure 4.6.3.1. Height of Load Above Building**

**A** = The maximum height that the load will be lifted above the top of the building must be specified in the plan if the building will be occupied during the operation.

**B** = The maximum height that the load will be lifted above the lower tier (if applicable) must also be specified if this portion of the building will be occupied during the operation.

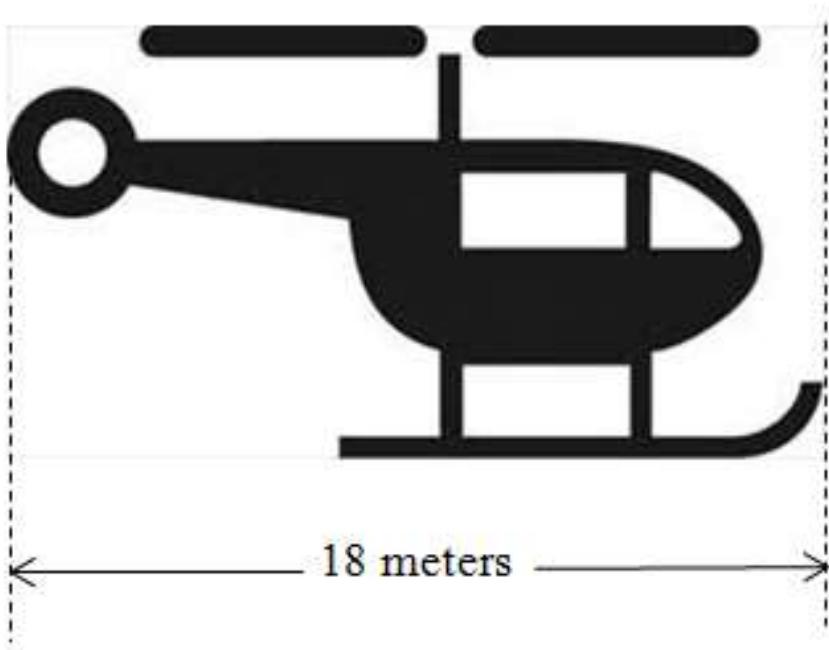
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**Figure 4.6.3.2. Non-Aerodynamic Load Operational Area, Forward Distance Below ETL**

**RADIUS** = Use the greater of:

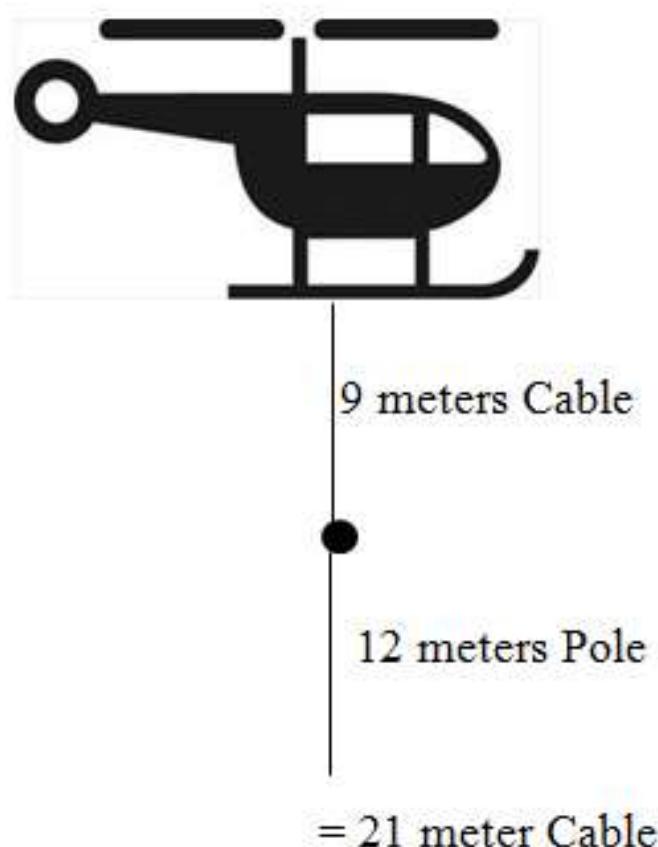


- a)  $1.5 \times$  Overall length of rotorcraft; or

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b) Overall length of load (including cable)

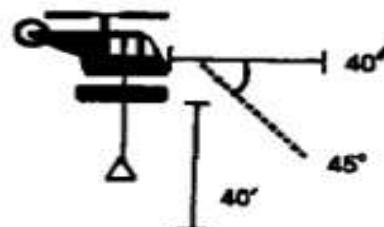
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**Figure 4.6.3.3. Non-Aerodynamic Load Operational Area, Forward Distance Above ETL**

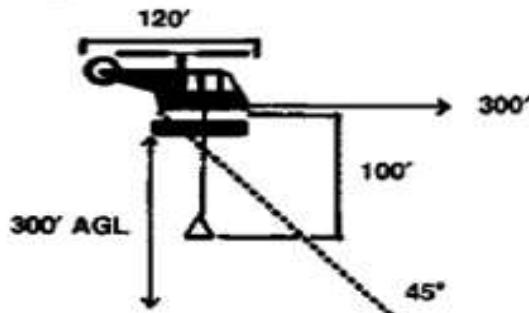
Minimum of: (But not less than 3 times overall length)

NOTE: Convert feet to meters

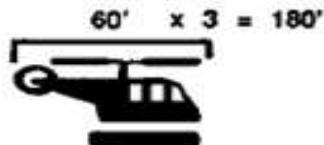
a) **45°, If helicopter altitude less than 50' AGL**



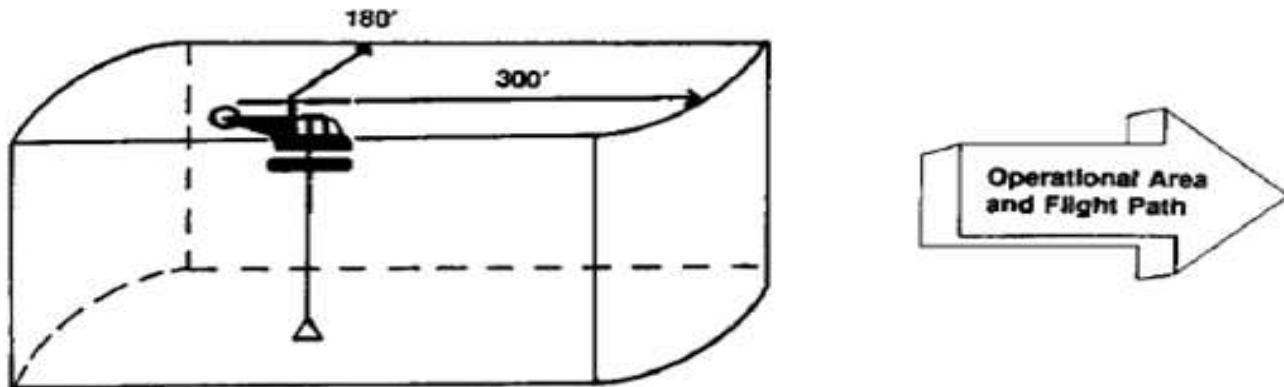
b) **Equal to rotorcraft altitude above 50' AGL**



c) **3 x Overall length of helicopter**



**Operational Area for the above example would equal 300' forward distance and would be depicted as:**



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**Figure 4.6.3.4. Aerodynamic Load Operational Area, Radius, and Forward Distance Computation Above ELT**

Use the greater of:

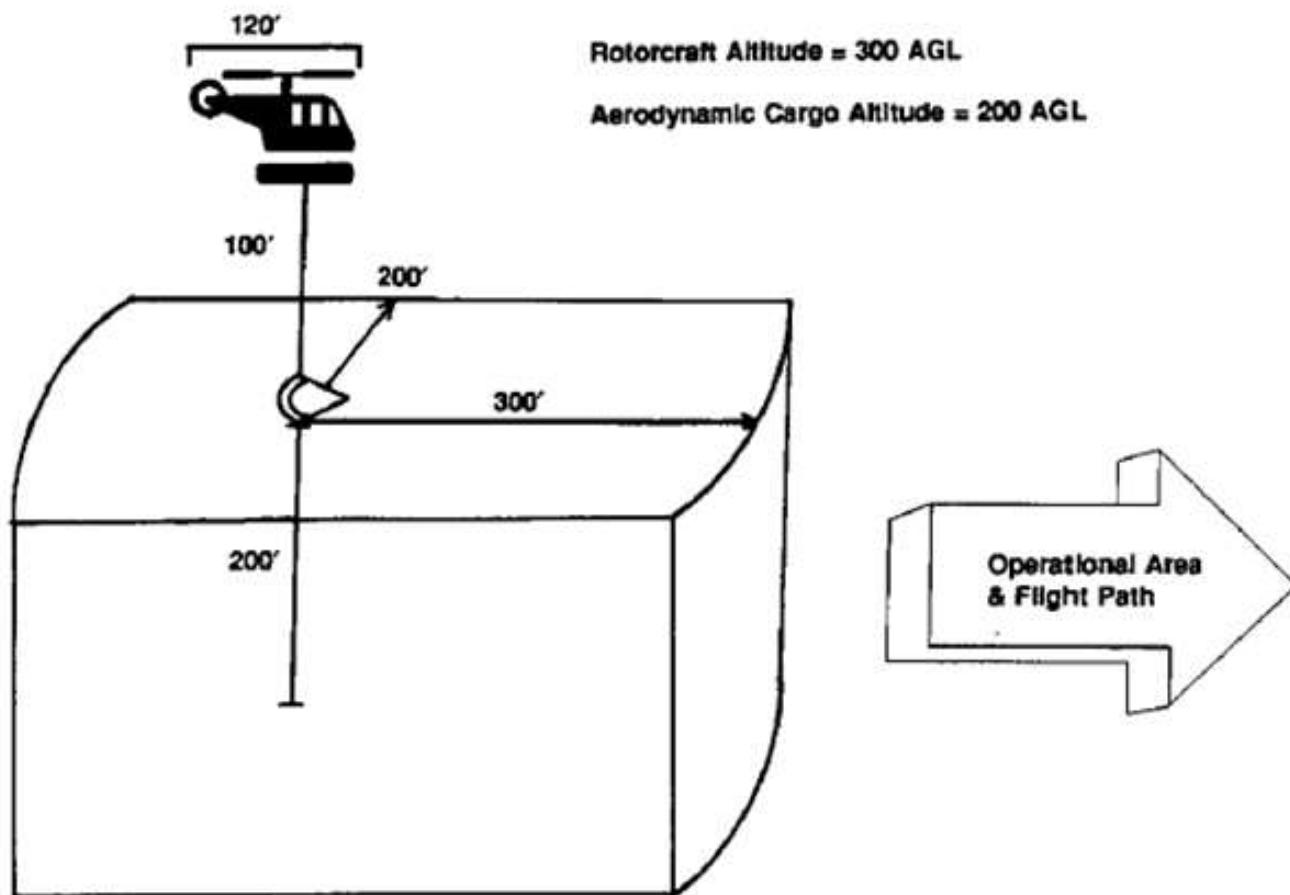
1. Non-aerodynamic load criteria

*OR*

2. Altitude (AGL) of aerodynamic external-load.

Using the same criteria from the non-aerodynamic load example in Figure 4.6.3.5 and adding the following aerodynamic load, the operational area would be depicted as:

**NOTE:** Convert feet to meters



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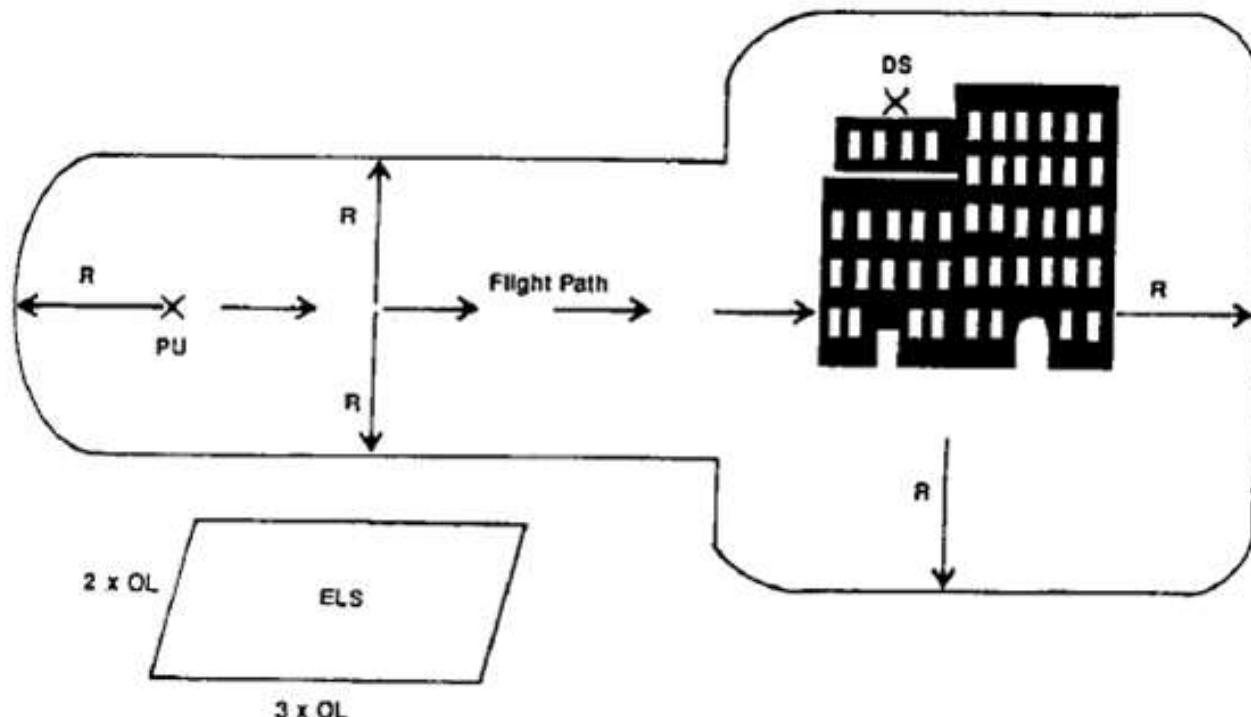
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**Figure 4.6.3.5. Operational Area Around Building and Emergency Landing Site**

**R** = 1.5 x Overall length (OL) of rotorcraft, including rotor blades

**PU** = pickup site

**DS** = delivery site



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**Figure 4.6.3.6. Letter Approving CAP with Contingencies**

[GACA Letterhead]

[Date]

[name and address of the operator]

Dear [name of the operator]:

The approval of the Congested Area Plan submitted by you on [date] is confirmed.

This approval concerns the proposed operation at [site location] on [date(s)], and is contingent on [cite contingencies as appropriate]. Inspectors from this office will monitor the operation to ensure compliance with the approved plan.

Should you have any questions or need to submit a change to this plan, please contact the GACA at [GACA telephone number].

Sincerely,

[Inspector's signature]

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### **VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 6. PART 133 ADMINISTRATION**

##### **Section 4. Evaluate a Rotorcraft-Load Combination Flight Manual (RLCFM)**

###### **4.6.4.1. GACA ACTIVITY REPORT (GAR).**

A. 1302 (OP) (Initial)

B. 1303 (OP) (Revision)

**4.6.4.3. OBJECTIVE.** The objective of this task is to ensure that an operator's Rotorcraft-Load Combination Flight Manual (RLCFM) meets regulatory requirements and provides adequate procedures and guidance for safely conducting external-load operations. In this section the Aircraft Flight Manual (AFM) for the rotorcraft is referred to as the Rotorcraft Flight Manual (RFM)

###### **4.6.4.5. GENERAL.**

**A. Authority.** The operator is required by General Authority of Civil Aviation Regulation (GACAR) Part 133, Appendix B (c) to develop an RLCFM as part of the operations manual required in GACAR § 133.61.

**NOTE:** The AFM of restricted category rotorcraft may already include all of the detailed information required for an RLCFM.

1) GACAR Part 133, Appendix B (c) requires the RLCFM to include the operating limitations, procedures, performance, and other information established under the GACARs. This also includes the information established during operational flight checks performed under GACAR Part 133, Appendix B (d)(2).

2) Limitations, procedures, performance, and other information not included in the approved rotorcraft flight manual (RFM) must be placed in the RLCFM.

**B. Content.** Instructions and specifications for the contents of the RLCFM are outlined in Subpart G of GACAR Parts 27 and 29, and GACAR Part 133 Appendix B. Subpart G requires that operating limitations and other information necessary for safe operation be established and

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made available to the crew members. This is done in the form of the RLCFM.

**C. Purpose.** The RLCFM is prepared in order to impart the information necessary for the safe carriage of external loads.

**D. Developing an RLCFM for Each Situation.** The applicant is required to develop an RLCFM for each rotorcraft (except for restricted category aircraft). The RLCFM must cover each class of external-load operation that will be conducted with a specific rotorcraft.

- 1) An RLCFM must be prepared for each rotorcraft, even if some makes and models are similar. The manufacturer's calculation of performance data and operating limitations may be unique for each rotorcraft.
- 2) If the operator wishes to add or delete a load class, the RLCFM must be revised accordingly to reflect the safety considerations.

**E. Initiation.** The applicant for a Part 133 Aerial Work Operator Certificate (AWOC) wishing to conduct rotorcraft external-load operations must submit two copies of an RLCFM to the General Authority of Civil Aviation (GACA) for approval. The RLCFM must be prepared in conformance to Subpart G of either GACAR Part 27 (Airworthiness Standards: Normal Category Rotorcraft) or GACAR Part 29 (Airworthiness Standards: Transport Category Rotorcraft).

**F. Operator Briefing.** The Aviation Safety Inspector (Inspector) usually advises an operator on how to prepare the RLCFM. The sample RLCFM (Figure 4.6.4.1) can be used as a guide for the operator. The operator should describe the step-by-step actions personnel shall perform to ensure compliance with the regulation.

### 4.6.4.7. ISSUES AND GUIDELINES FOR PREPARING THE RLCFM.

**A. An Acceptable RLCFM.** An RLCFM is complete and acceptable if it reports all of the items enumerated in paragraph 4.6.4.11 of this section, fulfills the requirements of Subpart G of GACAR Parts 27 or 29, and contains complete and accurate figures.

**B. Determine Authorized Masses.** The following methods are provided for the Inspector to assess how maximum authorized masses are determined:

- 1) The maximum external-load mass is determined by the Inspector for each load class for

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which approval is requested. That maximum mass reflects the attaching means maximum mass capacity.

- 2) Some aircraft are authorized to operate at a mass above the normal maximum gross mass when the excess mass is carried on the cargo hook. These higher masses are described in the RFM or RFM supplement. Sometimes an aircraft may have other approved special equipment installed that lowers or raises the maximum attaching means mass.
- 3) There are many other factors that affect the maximum mass that an aircraft could carry. Each of these should be clearly delineated within the operator's RLCFM. Each operator should develop procedures to guide their pilots in calculating the various factors that affect aircraft performance. Maximum mass based on aircraft structural limitations are not the only limiting factor. Some other considerations are aircraft empty mass, fuel required for operation, fuel reserve, crew mass, density altitude, and one engine inoperative performance (Class D). The RLCFM should discuss each of the factors and describe how the pilot applies them to each external-load operation.
- 4) An example of one way to calculate mass is shown in Table 4.6.4.1.

**C. Center of Gravity (CG) Considerations.** The RLCFM should contain information for use by the pilot in determining both the longitudinal and the lateral CG.

- 1) The RLCFM must contain information for calculating longitudinal and lateral CG (when lateral information is available) for each class of external load authorized, or reference the RFM for this information.
- 2) The list of maximum airspeeds and weights for each load class demonstrated in operational flight checks must be included in the RLCFM. If these were not accomplished before the RLCFM was written, return the document after the flight checks, and have the operator put the list in the RLCFM.

**Table 4.6.4.1. Mass Calculation**

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Maximum gross mass \_\_\_\_\_

**minus**

Aircraft empty mass \_\_\_\_\_

**minus**

Fuel required for operation \_\_\_\_\_

**minus**

20 minute fuel reserve \_\_\_\_\_

**minus**

Pilot mass \_\_\_\_\_

**equals**

Maximum authorized mass \_\_\_\_\_

(not to exceed maximum gross

mass or maximum attaching means mass)


**4.6.4.9. REVISIONS.** RLCFM revisions must be approved by the GACA before they are printed and distributed. Revisions must also conform to regulatory requirements. If a printed and distributed RLCFM revision does not conform to the appropriate regulations, the Operations Specifications (OpSpecs), or the AWOC, the Inspector should immediately notify the operator in writing, requesting appropriate action to resolve the problems.

**4.6.4.11. PROCEDURES.**

**A. Brief the Applicant.** Advise the operator to develop a document describing the procedures to be used to comply with the requirements outlined in this paragraph. Inform the applicant that the RLCFM must be an approved document that may be prepared with the advice of a GACA Inspector.

**B. GAR.** Open GAR file.

**C. RLCFM Contents.** Review the RLCFM for completeness of content and accuracy of the

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figures. Refer to GACAR133, Appendix B (c) for a list of requirements that the RLCFM must meet. (A sample RLCFM template is found in Figure 4.6.4.1. and a sample RLCFM is found in Figure 4.6.4.2.)

- 1) The RLCFM should state the operating limitations, normal and emergency procedures, performance, and other such information from subpart G of either GACAR Part 27 or 29, whichever is applicable.
- 2) GACAR 133, Appendix B (c)(2) requires the RLCFM to set forth the Classes (A, B, C, D) for which airworthiness of the rotorcraft has been demonstrated.
- 3) The RLCFM must include a section that gives the following information:
  - a) Information on any peculiarities discovered when operating with particular rotorcraft load combinations;
  - b) Precautionary advice about static electricity discharges for Class B and D loads;
  - c) Procedures for computation of lateral and longitudinal center of gravity (CG), if not adequately described in the RFM (the applicant usually must compute the lateral CG for each class, when lateral information is available); and
  - d) Any other information considered essential for safe operation which external-loads should be included.
- 4) The RLCFM must have a list of the maximum airspeeds and weights that were demonstrated while performing operational flight checks conducted by the manufacturer or the operator.

### **D. Results of RLCFM Evaluation.**

- 1) If the RLCFM is satisfactory, the certification project manager (for an initial certification) or the principal operations inspector (POI) (for an existing operator) approves the RLCFM as per Volume 3, Chapter 5. Return the original to the operator, and keep a copy for the file.
- 2) If the RLCFM is unsatisfactory, notify the operator in writing, indicating the areas of deficiency

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- a) Return the RLCFM for correction.
- b) Keep a copy of the letter sent to the operator in the file until the corrected RLCFM is returned.

**E. Revisions.** Inform the applicant that to revise the RLCFM, the applicant sends the original of the revision, one copy of the revision, and a new page control sheet to the Inspector.

- 1) Evaluate the revision as per original RLCFM approval.
- 2) Approve or reject the revision as per original RLCFM approval.

**F. GAR.** Close GAR file.

**4.6.4.13. TASK OUTCOMES.** Completion of this task results in either of the following:

- A. An approved RLCFM or an approved revision.
- B. A letter indicating that the RLCFM is not approved.

**4.6.4.15. FUTURE ACTIVITIES.** Possible review of revisions to the RLCFM.

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**Figure 4.6.4.1. Rotorcraft-Load Combination Flight Manual Template**

**ROTORCRAFT-LOAD COMBINATION FLIGHT MANUAL**

THIS SAMPLE RLCFM SHOULD BE MODIFIED TO REFLECT LIMITATIONS AND PROCEDURES APPLICABLE TO SPECIFIC EXTERNAL-LOAD OPERATIONS.

[Date submitted for approval]

Rotorcraft Registration Marks:

Rotorcraft Make and Model:

GACA Approved [date]

[POI's signature]

**CONTENTS**

**SECTION 1. OPERATING LIMITATIONS**

- 1. Certification**
- 2. Persons aboard**
- 3. Total mass and speed limitations**
- 4. Location of center of gravity**
- 5. Miscellaneous limitations**

**SECTION 2. LOAD COMBINATION OPERATING PROCEDURES**

- 1. Information peculiar to the load combination**
- 2. Operating procedures**
- 3. Emergency conditions**

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- 4. Static electricity discharges**
- 5. Other information essential to operational safety**
- 6. Ground-to-air hand signals**
- 7. External-load securing procedures**
- 8. Fuel burn/center of gravity**
- 9. Required placards**

**SECTION 3. INFORMATION**

- 1. General**
- 2. Flight and non-flight crew personnel**
- 3. Passengers**
- 4. Safety around rotorcrafts**
- 5. Date submitted for approval**
- 6. GACA-approved (date) Inspector**

**APPENDIX 1. CONGESTED AREA PLAN APPROVAL**

- 1. Sample Plan**
- 2. Sample Diagram of Area**
- 3. Letter of Agreement (if applicable)**

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**Figure 4.6.4.2. Sample Rotorcraft-Load Combination Flight Manual**

### **SECTION 1. OPERATING LIMITATIONS**

In addition to the operating limitations set forth in the approved Rotorcraft Flight Manual (RFM), this aircraft will be operated in accordance with the following operating limitations:

- 1.** No person may operate this aircraft with an external-load unless that person holds a GACA AWOC with approval for external-load operations and has satisfactorily completed the applicable knowledge and skills tests.
- 2.** No person who is not a required crew member may be carried aboard the aircraft unless that person performs an essential function in connection with the external-load operation. When the aircraft used requires a crew member to attend to an external load, that crewmember must wear a safety harness while not seated with a seat belt fastened.
- 3.** Operations must not be conducted over congested areas unless approved by the President in accordance with a congested area plan (CAP) developed in compliance with GACAR 133, Appendix B. (See sample plan in Appendix 1 of this manual.)
- 4.** No person may serve as a pilot of this aircraft during external-load operations, unless that person has passed the knowledge and skill tests required by GACAR 133, Appendix B for the class of operation being conducted.
- 5.** A copy of the RLCFM will be on this aircraft during all external-load operations.
- 6.** The total mass of this aircraft and load combination must not exceed:

Make and model \_\_\_\_\_ Registration Marks \_\_\_\_\_

Class A load max mass \_\_\_\_\_ # not to exceed mass \_\_\_\_\_

Maximum forward airspeed \_\_\_\_\_ knots (kts.) Other \_\_\_\_\_

**NOTE:** Maximum load figure as derived using a \_ kg. pilot mass and \_ kg. of fuel.

**NOTE:** Extreme caution must be exercised when carrying Class B external-loads, as controllability may be affected by the size and shape of the cargo.

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**7.** The location of the center of gravity for this aircraft and load combination must be within the center of gravity range established during type certification under GACAR Part 21 or for foreign registered aircraft within the range acceptable to the President.

**8.** Other limitations deemed necessary by the operator or contained in the approved flight manual or its supplements.

### SECTION 2. LOAD-COMBINATION INFORMATION

**1.** The operator will list information pertaining to the peculiarities of the load combination, such as the following

- a. oscillating tendencies
- b. ground effect
- c. density altitude
- d. strong or gusty winds
- e. abrupt control movements
- f. acceleration limitation
- g. maximum Class A lateral load imbalance
- h. lateral CG calculation procedure

**2. NORMAL.** Inspect the cargo sling or basket for proper installation and overall condition. Check the load to make sure it is rigged properly and safely. For Class B and C loads, check the electrical release and the manual release on the ground before flight. Arm the circuit by pushing the cargo release circuit breaker in.

This is an example of information that may be applicable to some types of cargo attach devices: Lift the cargo load to a hover, then check the remaining power to determine if there is enough to carry the load safely. While hovering, verify that directional control is adequate. When moving into horizontal flight, use smooth, slow control movements to minimize settling and to prevent the load from

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swinging. In climbing, forward moving flights, check for hazardous oscillations of the external-load. When approaching a landing area with a load, identify the delivery point, come in slowly, into the wind, at the shallowest possible angle to ensure that the load clears all obstructions safely. Start bringing in power early to slow your descent and forward airspeed, ending in a hover short of the release point and in view of any ground crew personnel. Follow ground signal instructions to hover over the release point. Place the load on the ground without any movement of the load. When the rotorcraft is stabilized over the load and has slack in the sling, open the cargo hook by normal means. In the event of electrical failure, use the manual release to drop the cargo load. If any difficulties arise during the flight that warrants an emergency landing, release the load immediately. If for some reason the load will not release, do not drag the load on the ground before touchdown. This may cause the aircraft to nose over with inadequate aft cyclic control to compensate.

**3.** Information regarding static electricity discharge: Before attaching the cargo hook to the load, make sure the aircraft has been grounded to dissipate charges of static electricity that may have built up during flight.

**4.** The operator will list any other information essential for safe operation, such as:

*a.* precautions to avoid high tension wires

*b.* lightning (Class C loads)

*c.* radio communications procedures

*d.* crossing over main highways

*e.* procedures for the placement of cargo at delivery may vary according to a specific operation class

**5.** All personnel engaged in the external-load operation will be familiar with and use the marshaling signals found in Appendix F of GACAR Part 91.

**6.** Class A external-load securing procedures: Use the company procedure to make precautionary landings in the event the securing devices become disconnected or loose.

**7.** Fuel burn-off and how it may affect the center of gravity en route.

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### 8. Required placards:

- a. A placard for the maximum external-load will be marked on each side of the fuselage near the external-load hook or basket if a Class A load.
- b. An instrument panel placard will be installed describing load class approval and passenger occupancy limitations.

**9. Class B Cargo Hookup:** After the rotorcraft has been directed into position, one ground crew member should remain within sight of the pilot to give positive direction with hand signals, or remain in direct radio contact with the pilot, while an appropriate number of other crew members attend to the cargo hookup. All hookups made to the rotorcraft while it is in a hover should be hastened to minimize the time the hookup personnel spend underneath the rotorcraft. If a hookup is to be performed without the aid of a ground guide and without using direct visual operational contact, an air crew member should lie prone on the floor and look downward from the main entrance doorway where the actions of the ground crew members can be observed; the pilot can be directed by this crew member on the inter phone. Crew members should wear approved safety harnesses when not seated with seat belts fastened.

**10. Hand Signals:** When giving hand signals to the pilot, a ground crew member must stand in front of and to the pilot's side of the rotorcraft, within sight of the pilot.

**11. Class D Authorization - Carriage of Persons:** All Class D operations will be conducted using only approved personnel lifting devices. Each operation will be conducted with a minimum of two crew members on board the rotorcraft. Intercom communication will be maintained between the pilot and other crew member. This second crew member must be able to advise the pilot of the status of the lift device and be able to release the empty device should it become necessary. This release must require two separate and distinct actions: arm the system; depress the release button. Where possible, a third person associated with the lift will be in position on the surface and communicating by radio with the pilot. This person's purpose is to advise the pilot of any safety related item and to supervise the loading or unloading of the personnel lifting device. Further, this person should ensure that the maximum mass appropriate for this operation, as determined by the pilot, is not exceeded.

The operating limitations as set forth in section 1 and the load combination information contained in section 2 are the conditions under which I will conduct this rotorcraft external-load combination operation.

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Operator's signature

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**APPENDIX 1.**

**CONGESTED AREA PLAN**

Name, address, telephone number of Operator:

Name, address, telephone number of Contractor:

Rotorcraft Registration Marks:

Rotorcraft Make and Model (HU-369D, etc.):

Rotorcraft Airworthiness Category (Normal, Restricted, Transport):

Pilot Name and Certificate Number:

DATES AND TIMES OPERATION WILL BEGIN AND TERMINATE:

Date	Time begin	Time end

Name, title, and telephone number of appropriate official of the local subdivision who has agreed to exclude unauthorized persons from the operational area, if applicable:

List of streets or roads that will be blocked during operation, if applicable:

Ingress/Egress routes, if applicable:

(If appropriate) This operation has been coordinated with the following air traffic control facilities:

Description and Mass of Loads To Be Carried:

Class \_\_\_\_\_

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Description \_\_\_\_\_

Length of attaching means (includes hook and cable) \_\_\_\_\_

Mass of load \_\_\_\_\_

Physical size of load \_\_\_\_\_

List of Buildings that shall be either partially or entirely unoccupied by persons:

Building Description/Address: \_\_\_\_\_ Owners: \_\_\_\_\_ Telephone number: \_\_\_\_\_

Load Penetration (for occupied buildings): How many floors could be penetrated by the load if dropped from the highest point it will be lifted above the building? \_\_\_\_\_ floors. What is maximum height the load will be lifted above building? \_\_\_\_\_ ft. Are charts, maps, and/or diagrams attached?

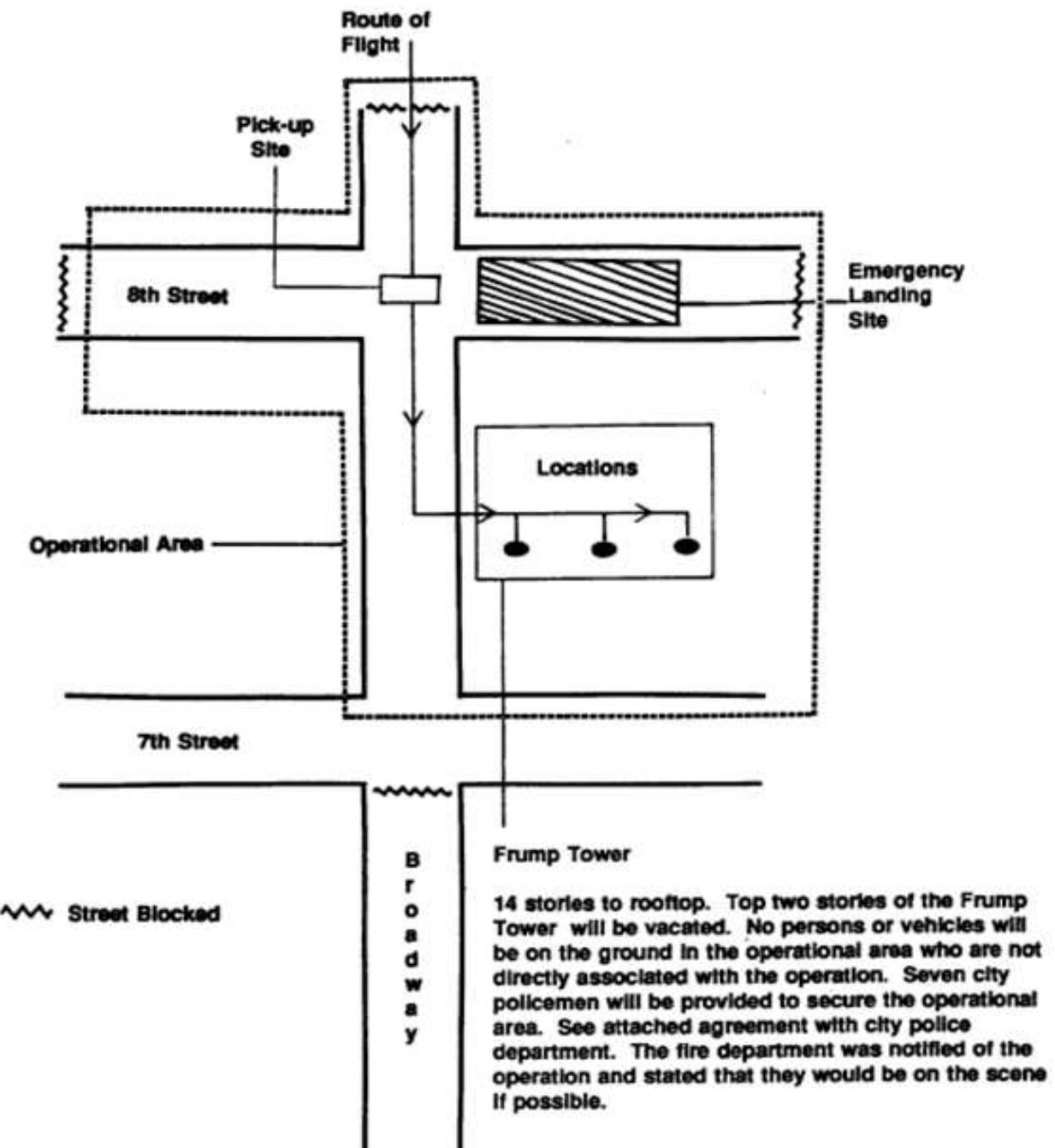
Narrative description of pickup site, route, delivery site, and plan for ceasing operation if unauthorized persons enter operational area.

[company official's signature]

[title]

[date]

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### **VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 6. PART 133 ADMINISTRATION**

##### **Section 5. Evaluate a Chief Pilot and/or Operations Manager for Part 133**

###### **4.6.5.1. GACA ACTIVITY REPORTING (GAR).**

A. 1525 (OP)

**4.6.5.3. OBJECTIVE.** The objective of this task is to approve an applicant for chief pilot or operations manager for an aerial work operation certificated under General Authority of Civil Aviation Regulation (GACAR) Part 133.

###### **4.6.5.5. GENERAL.**

**A. Designation.** Each operator issued a GACAR Part 133 Aerial Work Operators Certificate (AWOC) is required to have both a chief pilot (GACAR § 133.41) and an operations manager (GACAR § 133.43).

**NOTE:** The President may authorize the designation of a single person as both chief pilot and operations manager if the President finds that, because of the limited size of the operation, the functions of the chief pilot and the operations manager can be performed by one person.

**B. Chief Pilot.** The applicant must designate one pilot, (who may be the applicant), as chief pilot. The applicant also may designate qualified pilots as assistant chief pilots to perform the functions of the chief pilot when the chief pilot is not readily available. Both the chief pilot and assistant chief pilots must be acceptable to the President and:

- Each must hold a current Commercial or ATP Certificate, with a rating appropriate for the aircraft operated

**C. Operations Manager.** The applicant must designate one person, (who may be the applicant), as operations manager. The operations manager must be acceptable to the President and:

- Hold a current Commercial or ATP Certificate, with a rating appropriate for the aircraft

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operated or

- Have at least 2 years flight operations experience with a holder of an AWOC or an AOC, or equivalent military experience

**D. Initiation.** The General Authority of Civil Aviation (GACA) approval of both the chief pilot and operations manager is conducted during the aerial work operator certification process. See Volume 3, Chapter 5, The Certification Process for Part 133, for additional information.

**E. Operations Specifications (OpSpecs).** The information regarding the chief pilot and operations manager will be noted in Operations Specification (OpSpec) A06.

### 4.6.5.7. CHIEF PILOT.

**A. Knowledge and Skills.** GACAR § 133.41 requires that the chief pilot demonstrate proficiency in knowledge and skill regarding the aerial work operations the operator is authorized to or intends to conduct. For any types of aerial work operations not listed below, the Aviation Safety Inspector (Inspector) may use their own discretion when determining the candidate's knowledge and skill level. The knowledge and skills required by specific types of aerial work operations may be found:

1) *Aerial Application Operations:* Volume 3, Chapter 5, Section 2, Special Considerations for Aerial Application Operations.

2) *Rotorcraft External Load Operations:* Volume 3, Chapter 5, Section 3, Special Considerations for Rotorcraft External Loads Operations

3) *Banner Towing Operations:* Volume 3, Chapter 5, Section 4, Special Considerations for Banner Towing Operations

**NOTE:** If the applicant fails a portion of the test, the Inspector may use discretion in the handling of the remainder of the exam. The Inspector may terminate the test at the point of failure, debrief the pilot on the failed portion, notify the operator of the test results, and schedule a retest.

**B. Responsibilities.** The chief pilot is responsible for the professional standards of flight crew members and in particular:

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- Developing standard operating procedures (SOP)
- Developing or implementing all required flight crew member training programs
- Issuing directives and notices to flight crew members as required
- Completion and dissemination of accident, incident, and other occurrence reports
- Completion of any crew reports
- Supervision of flight crew personnel
- Assuming responsibilities delegated by the Operations Manager
- Ensuring that duties are delegated to qualified individuals

**C. Change in Designation.** The operator must report any change in designation of chief pilot or assistant chief pilot immediately to the GACA. The new chief pilot must be designated and must comply with GACAR § 133.41 within 30 days or the operator may not conduct further operations under the AWOC unless otherwise authorized by the President.

**D. Delegation of Responsibility.** The operator may designate an assistant chief pilot to conduct the chief pilot's duties in the chief pilot's absence. The assistant chief pilot must meet the same requirements as the chief pilot and the applicant must be acceptable to the President.

### 4.6.5.9. OPERATIONS MANAGER.

**A. Knowledge and Skills.** GACAR § 133.43 requires that the operations manager demonstrate proficiency in knowledge and skill regarding the aerial work operations the operator is authorized to or intends to conduct. For any types of aerial work operations not listed below, the Inspector may use their own discretion when determining the candidate's knowledge and skill level. The knowledge and skills required by specific types of aerial work operations may be found:

- 1) *Aerial Application Operations:* Volume 3, Chapter 5, Section 2, Special Considerations for Aerial Application Operations.

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2) *Rotorcraft External Load Operations*: Volume 3, Chapter 5, Section 3, Special Considerations for Rotorcraft External Loads Operations

3) *Banner Towing Operations*: Volume 3, Chapter 5, Section 4, Special Considerations for Banner Towing Operations

**NOTE:** If the applicant fails a portion of the test, the Inspector may use discretion in the handling of the remainder of the exam. The Inspector may terminate the test at the point of failure, debrief the pilot on the failed portion, notify the operator of the test results, and schedule a retest.

**B. Responsibilities.** The operations manager is responsible for safe flight operations and in particular:

- Control of day-to-day operations and operational standards of all aircraft operated
- Operations co-ordination functions which impact on operational control (such as, maintenance, crew scheduling, load control, equipment scheduling)
- Maintenance and distribution of the certificate holder's operations manual
- Training and qualification of flight operations personnel
- Liaison with the GACA on matters concerning flight operations including any variation to the AWOC
- Liaison with any external agencies which may affect operations
- Ensuring that the operator's operations are conducted in accordance with current regulations, standards and the certificate holder's operations manual
- Ensuring that crew scheduling complies with fatigue management requirements
- Ensuring that all crew members are kept informed of any changes to applicable regulations and standards
- Receipt and dissemination of any aeronautical information affecting the safety of flight

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- Dissemination of flight operations safety information
- Qualification of flight crew members
- Ensuring that responsibilities for operational control functions are delegated to qualified personnel

**C. Delegation of Responsibility.** The operations manager may delegate responsibility for his functions, including operational control functions, to appropriately qualified personnel.

**4.6.5.11. PROCEDURES.** For an initial aerial work operator applicant, follow the guidance found in Volume 3, Chapter 5, The Certification Process for Part 133. If this is a revision to an existing operator's OpSpecs, review the revision and follow the guidance found in Volume 1, Chapter 4, Section 1, General Information and the Approval or Acceptance Process.

**4.6.5.13. TASK OUTCOMES.** Completion of this task results in designation as a chief pilot and/or operations manager for aerial work operations with OpSpec A06.

**4.6.5.15. FUTURE ACTIVITIES.**

- A. Retest a pilot who was unsatisfactory.
- B. Test the applicant again for an additional authorization.

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**VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

**CHAPTER 6. PART 133 ADMINISTRATION**

**Section 6. Authorization for Motion Picture and Television Filming**

**4.6.6.1. GACA ACTIVITY REPORTING (GAR).**

A. 1943 (OP)

B. 34230 (AW)

**4.6.6.2. OBJECTIVE.** The objective of this task is to:

- 1) Review and evaluate a request for Authorization for motion picture and television Operations.
- 2) Check the motion picture and television filming production procedures in the operations manual against safety requirements for this operation.
- 3) Ensure the aircraft pilot/operator has developed safe operating procedures, guidelines, and criteria to operate below the altitudes required in GACAR part § 91.67(b) and (c) and §91.417.
- 4) Successful completion of this task will result in the acceptance of the operations manual, the issuance of GACAR Part-133 Operations Specification A-19 (MOTION PICTURE AND TELEVISION FILMING OPERATIONS), or the disapproval of the application.

**4.6.6.3. GENERAL.**

**A. Purpose of the Motion Picture and Television Authorization.**

- 1) The motion picture and television industries utilize aircraft to support their filming operations as subject aircraft and behind-the-scenes aircraft. These aircraft must often be flown at altitudes and/or horizontal distances less than the minimums specified in § 91.67(b) and (c). Additionally, these aircraft are often required to perform aerobatic

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maneuvers below the minimum 1,500 feet above the surface as specified in § 91.417(e) or proximity to persons, property, or airspace as specified in § 91.417(a) through (d).

2) A waiver of § 91.67 is required for any flight below 1,000 feet above ground level (AGL). A waiver of the requirements of § 91.67(b) and (c) is necessary when aircraft must be flown closer than 500 feet from participating persons or property. If filming sequences require an aircraft to be flown in aerobatic flight below 1,500 feet AGL or over certain congested areas, open-air assembly of persons, or designated airspace, a waiver of § 91.417(a) through (e) is required.

### **B. Definitions.**

1) **Participating /Authorized Person:** All persons associated with the filming production must be briefed on the potential risks of the proposed flight Operation and acknowledge and accept those risks. Nonparticipating persons are the public, spectators, media, and others not associated with the filming production.

2) **Subject Aircraft:** Any aircraft being filmed in a motion picture or television-filming event.

3) **Behind-the-Scenes Aircraft:** Any aircraft used in the filming event that is not the subject aircraft (e.g., camera aircraft carrying lights for the scene, aircraft causing background noise or wind, or aircraft placing additional personnel into or around the scene but not in the scene).

### **C. Considerations.** Essential personnel may be filmed while on the exterior of, or entering or exiting, an aircraft in flight. The following are possible scenarios:

1) Airplanes that include traditional external activities such as wing walking, parachuting, air-to-air transfers, air-to-ground transfers, ground-to-air transfers, towing (banners or equipment), and other motion picture and television activities.

2) Balloons that include rappelling, long-line operation, in-flight transfers, rope ladders, and other motion picture and television activities.

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3) Helicopter activities that include rappelling, long-line operation, external camera operators, and other motion picture and television activities may constitute an external load. However, GACA does not provide Class B, C, or D certification for non-jettisonable activities. They would not be approved as external-load Operations under GACA part 133. Pilots and/or operators using these techniques will be required to demonstrate their ability to operate with these loads before being authorized for flight in the motion picture and television activities. The pilot may show competency if he or she has either a letter of competency or an appropriate logbook entry in accordance with part 133, Appendix B.

### **D. Aircraft.**

#### **1) Restricted and Experimental Category Aircraft.**

- a. Restricted category aircraft may only be operated for the special purpose for which it is certificated.
- b. In order to be used in motion picture and television filming Operations as the subject aircraft, the aircraft must have an airworthiness certificate issued in the appropriate category (e.g., experimental/exhibition or restricted if demonstrating its purpose in the film, such as agricultural operations).

#### **2) Helicopters.**

- a. Minimum safe altitude for helicopter Operations is stipulated under § 91.67(d). However, movie-making helicopter Operations below 500 feet AGL may create a hazard to persons or property on the surface by drawing non-participants into the area. Therefore, a certificate of waiver must be obtained in accordance with GACAR Part 91, Subpart H.
- b. Helicopter aerobatic flights are stipulated in § 91.417. If a certificate of waiver is required, an applicant must follow the requirements stipulated in GACAR Part 91, Subpart H.

### **E. Submission.**

The request for motion picture and television filming Operations, including a proposed motion picture and television Operations manual, must be submitted at least 45 days before actual filming begins. The submission of the request and a proposed operations manual are the

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applicant's sole responsibility.

### **F. Approval or Disapproval.**

Upon receiving the request from the applicant, the responsible Principal Operations Inspector (POI) processes the request within 30 days of receipt; GACA must issue either an (A-19) Operations Specification to the requesting GACAR Part-133 operator or disapproval of the application.

### **G. Expiration Date.**

GACA authorization for motion picture and television filming is valid as long as the Part-133 AWOC operator certificate is valid.

### **H. Motion Picture and Television Operations Manual.**

The operator must include the operating and safety procedures in a motion picture and television operations manual.

The Operations Manual, once accepted, becomes part of the authorization. The Operations Manual is the standard by which a certificate holder must conduct all operations under the A-19 Operations Specification. The controls, procedures, and conditions outlined in the Operations Manual are the primary assurance that non-participating persons will not be harmed. Accepting the operation manual will be the basis for authorizing Operation's motion picture and television area and/or issuing the waiver. Noncompliance with the Operations manual is a violation of authorization terms and may lead to cancellation.

### **I. Operations Manual Revisions.**

Inspectors should encourage operators to discuss manual revisions with the responsible POI before submission for acceptance. A proposed manual revision must be submitted to the POI for review at least 15 days before its effective date. The operator will only distribute revisions once the POI has accepted them. If the revisions are not accepted, the inspector must notify the operator in writing within 10 business days.

### **J. Special Provisions.**

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- 1) The following statement must appear in the issued A-19 Operations Specification: “The certificate holder must adhere to the accepted motion picture and television Operations manual”.
- 2) Traditional seating for the PIC of various aircraft does not always lend itself to be the safest position from which to conduct a flight. The primary seat may not be the optimal location, depending on the subject aircraft. The decision of where to sit may be determined by the PIC.
- 3) Additional provisions deemed appropriate by the President to ensure the safety of the operations should be prescribed by the POI (see Figure 4-6-3D, Sample Motion Picture and Television Operations Manual Special Provisions).

### **4.6.6.4. CONTENTS OF THE MOTION PICTURE AND TELEVISION OPERATIONS MANUAL.**

The applicant must submit an original and one copy of the motion picture and television operations manual. (Figure 4-6-5E, Volume 3, section 5 Motion Picture and Television Operations Manual Development Guide, is a sample guide for the manual's requirements for use by the applicant.). The manual must include at least the following:

#### **A. Operator Organization**

- Operator name.
- Address and telephone number of the applicant or responsible person.

**B. Distribution and Revision.** This section contains procedures for revising the operations manual and keeping all manuals current. Revisions for the accepted operations manual shall be forwarded to the POI at least 15 days before the proposed effective date.

**C. Persons Authorized.** GACAR § 91.67(c) is waived only concerning those participating persons, vehicles, and structures directly involved in the performance of the actual filming. The operations manual will include procedures to ensure that no persons are allowed within 500 feet of the area except those consenting to be involved and necessary for the filming production. This provision may be reduced to no less than 200 feet if an equivalent level of safety (ELOS) can be

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achieved, and the President has approved it by issuance of a waiver. For example, an ELOS may be determined by Flight Operation inspector's evaluation of the filming production area to note terrain features, obstructions, buildings, etc. Such barriers may protect nonparticipating persons (e.g., observers, the public, or news media) from debris in the event of an accident.

**D. Area of Operations.** There will be a variety of operational needs, depending upon the applicant's activities. Certain companies may confine their activities to a local area. In contrast, other operators may conduct activities throughout the entire KSA. The manual shall define the area authorized by the authority. Although the operator's responsible POI issues authorization, the operator must coordinate with the POI accountable for the filming Operations site.

**E. Plan of Activities.** The manual must include procedures for the operator to submit a written plan of activities to the responsible POI having jurisdiction over the area of proposed filming three days before the scheduled filming date. The POI may waive the three-day notification with proper justification of the exception to the 3-day requirement.

The plan of activities must include at least the following:

- 1) Dates and times for all flights.
- 2) Name and phone number of person responsible for the filming production event.
- 3) Name and phone number of person responsible for the aircraft.
- 4) Make, model, and serial or N-number of aircraft to be used and type of airworthiness certificate, including category.
- 5) Name and certificate number of pilots involved in the filming production event, including any notation of external-load endorsements or aerobatic competency, if required.
- 6) A statement that the waiver holder has obtained permission from property owners and/or local officials to conduct the filming production event. The list of those who gave permission must be made available to the inspector upon request from the waiver holder.
- 7) Signature of authorization holder or representative.
- 8) A description of the flight activity including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the minimum altitudes essential to accomplish the operations.

**F. Permission to Operate.** The motion picture and television operation manual will specify requirements and procedures for the pilot/operator to obtain permission from property owners

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and/or local officials (e.g., police or fire departments) as appropriate for the conduct of all operations when operating under the provision of the waiver.

**G. Security.** The applicant will specify the provided method of security to exclude all persons not directly involved with the operations from the location. For safety, provisions must include stopping activities when unauthorized persons, vehicles, or aircraft enter the operation area or for any other reason. If security is not needed, “**Not Applicable**” should be entered.

**H. Briefing of Pilot/Production Personnel.** The manual shall include procedures to brief participating personnel of the risks involved, emergency procedures, and safeguards to be followed during the filming production event. Personnel will also be briefed on additional provisions that may be issued by the POI responsible for the operational area, including the location of boundaries or time limits. The briefing shall cover:

- 1) Authorization for motion picture and television and the attached special provisions, Operations manual,
- 2) Plan of activities,
- 3) Aircraft parking and starting,
- 4) Taxi procedures,
- 5) Radio communications,
- 6) Takeoff procedures,
- 7) Aviation activities to be conducted during the filming production event, Approach, and landing procedures,
- 8) Recall procedures,
- 9) Emergency procedures,
- 10) Risks to participating personnel, and
- 11) How to control nonparticipating persons

**I. Certification/Airworthiness.** The aircraft may be certificated in any category, including experimental, provided the requirements of GACAR§ 91.417 are met. Procedures shall be included to ensure that aircraft inspections follow the applicable parts of GACAR part 43 and 91 and the assigned operating limitations as applicable.

**J. Pilot Personnel—Minimum Requirements** The operator shall establish and specify the minimum pilot requirements. Minimum requirements shall meet or exceed the following:

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- 1) A current KSA Commercial Pilot Certificate with ratings appropriate to the category, class, and type (if applicable) of aircraft to be used under the terms of the waiver.
- 2) A first-class GACA medical certificate.
- 3) At least 500 hours logged as the PIC and at least 20 hours logged as the PIC in the aircraft type.
- 4) A minimum of 100 hours in the category and class of aircraft to be used.
- 5) minimum of 5 hours in the make and model (M/M) aircraft to be used under the waiver
- 6) In the event that the 1,500-foot minimum standard contained in § 91.417(e) is to be waived, the pilot performing aerobatic maneuvers must hold a valid GACA Form 8710-7 (Statement of Aerobatic Competency (SAC)) to perform the operation.
- 7) In the event that the operation to be conducted contains elements of external-load Operations (either fixed-wing or rotary-wing Operation), pilots used in the operations shall be qualified. This qualification may be obtained through (oral or written) Knowledge test or skill. A Flight Operation inspector can give this test, or another company pilot approved by the responsible POI and qualified to perform external load operations. The test must cover the following subjects:
  - (a) Steps to be taken before starting operations, including a survey of the flight area.
  - (b) Proper method of loading, rigging, or attaching the external load.
  - (c) Aircraft performance capabilities under motion picture operating procedures and the Aircraft Flight Manual (AFM).
  - (d) Proper instructions for flight and ground crew personnel.
  - (e) AFM, pilot's operating handbook (POH), or a Rotorcraft-Load Combination Flight Manual (RLCFM) and limitations, if appropriate.

**K. Communications.** The operations manual must contain procedures to provide communications capability to all participants during the actual operation and filming.

The communications must be able to keep all the participants apprised of the current status of the operation.

**L. Accident Notification.** The Operations manual must contain procedures for notification and reporting of accidents, protection of the accident scene, and notifying the KSA AIB (Aviation

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Investigation Bureau).

**M. Recall/Stop Procedures.** The applicant can use radio communications, oral, visual, or any combination acceptable to the President as long as it keeps the participants continuously apprised of the current status of the operations.

**N. Aerobatic Competency.** If the filming Operations require the issuance of GACA Form 8710-7, see Volume 11, Chapter 1, Section 1.

### **4.6.6.5. REREQUISITES AND COORDINATION REQUIREMENTS.**

**A. Prerequisites.** This task requires knowledge of the regulatory requirements of part 91 and GACA policies and qualification as Flight Operation Inspector.

**B. Coordination.** This task will require coordination with the airworthiness department within the aviation safety and environmental sustainability sector.

### **4.6.6.6. CES, FORMS, AND JOB AIDS.**

#### **A. References (current editions):**

- GACAR Parts 1, 21, 43, 61, 91, and 133.
- GACA eBook VOLUME-15, CHAPTER 5. PART 133 – Operations SPECIFICATIONS.

#### **B. Forms:**

- GACA Form 8000-36, Program Tracking and Reporting System Data Sheet.
- GACA Form 8710-7, Statement of Aerobatic Competency.

### **4.6.6.7. ROCEDURES**

#### **A. Application for Motion Picture and Television Operations Authorization.**

- 1) The POI receives an application request from the GACAR Part-133 holder for Motion

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Picture and Television Operations Authorization.

- 2) The POI will advise the applicant to become thoroughly familiar with the requirements of item (4.6.6.3) in this section, especially the detailed requirements for the Motion Picture and Television Operations Manual.
- 3) The POI will advise the applicant that the application must be submitted to the POI at least 45 days prior to obtaining the required authorization via A-19 OpSpec.

### **B. Open the GAR Record.**

(TBD)

**C. Receipt of Motion Picture and Television Operations Manual.** Using the information provided by the applicant and the information in paragraphs 4-6-6-3 through 4-6-6-5, the operations manual for all pertinent information for the proposed filming production event. Minor text corrections that are indicated by strikeovers and initialed by the applicant are accepted.

**D. Review Operations Manual.** Ensure that the Operations manual contains the items stipulated in paragraph 4-6-6-4.

1. If the manual is unsatisfactory:

- a) Contact the applicant and explain sections or paragraphs, or sentences of the Operations manual that must be corrected.
- b) Prepare a letter of non-acceptance of the manual (see Figure 4-6-3G, Sample Letter of Non-acceptance of a Flight Operations Manual) with a suspected date for submission of the corrected Operations manual.
- c) Retain a copy of the operations manual for future comparison.
- d) Return the application, one copy of the operations manual and the letter of non-acceptance to the applicant.

2. If the manual is satisfactory:

- a) Prepare a letter of acceptance of an operations manual (see Figure 4-6-5H, Sample Letter of Acceptance of a Flight Operations Manual).

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b) Continue with the task.

### **E. Aerobatic Competency.** Determine if GACA Form 8710-7 is required.

1) If the operator has requested a waiver of § 91.417(a) through (e), GACA Form 8710-7 for motion picture and television filming must be issued.

*NOTE: This waiver is issued only with respect to participating persons, vehicles, and structures directly involved in the performance of the actual filming.*

2) See Volume 11, Chapter 1, Section 1.

### **F. Prepare OpSpec A-19.**

- 1) Follow eBook VOLUME-15, Chapter-5 to issue OpSpec A-19.
- 2) Ensure the A-19 OpSpec table is filled correctly, reflects the affected aircraft, and includes the proper reference to the operations manual.
- 3) If there is any certificate of waiver involved within the authorization process, make sure it is reflected on OpSpec A-5.
- 4) Process the required signatures for OpSpec A-19 in accordance with the established policies and procedures.
- 5) Prepare a reminder notice/letter (see Figure 4-6-5J, Sample Letter of Reminder) to the authorization holder, reminding them that a plan of activities must be submitted and accepted before each filming production event, including any special provisions.

### **G. Responsible General Authority of Civil Aviation (POI).**

Prepare a file on the applicant that includes, but is not limited to, a copy of the following documents (as applicable):

- a) Application for the authorization,
- b) Operations manual,
- c) Notice/Letter of Disapproval of Application,
- d) Notice/Letter of Non-acceptance of the Operations Manual or notice/Letter of Acceptance of the Operations Manual,
- e) Notice/Letter of Reminder, and Any other documents of correspondence.

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**4.6.6.8. TASK OUTCOMES.** Completion of this task results in one or more of the following:

- a) Issuance of OpSpec A-19 reflecting all authorized operational details.
- b) An accepted Operations manual.
- c) Letter of Acceptance of a Flight Operations Manual.
- d) Letter of Reminder to submit a plan of activities.
- e) Issuance of GACA Form 8710-7, if required.
- f) Disapproval of an application; and
- g) A Letter of Non-acceptance of a Flight Operations Manual.

**4.6.6.9. FUTURE ACTIVITIES.**

- a) Amendment of OpSpec A-19.
- b) Cancellation/ Suspension of OpSpec A-19.
- c) Review proposed revisions to the operations manual.
- d) Review the operator's plan of activities.
- e) Surveillance of any Operation approved by the authorization (see Volume 12, Chapter 8).
- f) Possible enforcement investigation.
- g) Take part in an investigation as a result of an accident, incident, or violation of the regulations; and/or Rescind GACA Form 8710-7 or require reevaluation.

### **Figure 4-6-3D. Sample Motion Picture and Television Operations Manual Special Provisions**

1. The Part-133 AWOC holder must adhere to the motion picture and television Operations manual.
2. The controls, procedures, and conditions set forth in the [insert name of company] motion picture and television Operations manual is the primary assurance that persons on the surface will not be jeopardized. This is the basis for issuance of the authorization. Therefore, failure to comply with the provisions of the manual will be considered a violation of the terms of the authorization and may constitute justification for cancellation of the authorization.
3. The aircraft and pilots used under this authorization will only be those specified in the [insert name of company] motion picture and television Operations manual or associated plan of activities. Each pilot's name and certificate number shall appear on each daily plan of activity.
4. All civil aircraft and pilot(s) participating in the activity shall be available for GACA inspection before the scheduled event.
5. The GACA has the authority to cancel or delay some or all participants or events if, in its

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opinion, the safety of persons or property on the ground or in the air is in jeopardy, or there is a contravention of the terms of the authorization and /or waiver.

6. Authority to deviate from the regulations is limited to the specific regulations shown on OpSpec A-5 that has been issued to the operator.

7. All flight operations conducted under this authorization will be performed in accordance with GACAR part 91, § 91.165, basic visual flight rules (VFR) weather minimums, except as provided in the waiver holder's motion picture and television Operations manual, Special Provisions, Aerobatics.

8. Aircraft may not be flown along a path that would require excessive maneuvering to avoid nonparticipating persons on the surface in the event of an emergency.

9. The holder of this manual shall ensure that each pilot in command (PIC) conducting operations under this authorization understands the conditions of issuance, and that it constitutes a waiver of [insert applicable regulations (e.g., §§ 91.67(b) and (c), 91.417(a) through (e)

10. Section 91.67(b) is waived only with respect to participating persons, vehicles, and structures directly involved in the performance of the actual filming. Flight Operations closer than 500 feet (200 feet, if authorized) or flights over a group of nonparticipating persons at less than 1,000 feet above ground level (AGL) are prohibited.

11. Rotorcraft takeoff and landing areas must be protected in a manner that will prevent unauthorized persons from entering the helipad area. The helipads must be located so the aircraft will not pass over nonparticipating personnel during takeoff and landing.

12. In the event of an accident considered to be the result of an event deficiency or procedure, flight operations will be canceled until the deficiency has been corrected and the correction accepted by the responsible POI responsible for the geographic area in which the activity occurred.

13. The holder of the authorization shall ensure that the participating persons involved in the operations are thoroughly briefed on special procedures, communications, emergency procedures, and the provisions of the authorization and/or waiver before beginning the activities. This requirement applies to all persons within 500 feet of the aircraft during waived activity. No person may participate in any event unless that person has received a briefing on the provisions of the waiver.

14. The holder of the [insert name of company] motion picture and television operation manual shall maintain primary responsibility for safeguarding persons and property on the surface.

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15. The certificate holder must submit 3 days prior to scheduled filming a written plan of activities to the POI. The 3-day notification may be waived with the concurrence of the POI. Justification of the exception to the 3-day requirement is required.

16. Aircraft operated under this authorization will have on board an airworthiness certificate appropriate for the operations being conducted.

17. Revision # (if appropriate) \_ \_ POI Movie Manual Special Provisions [Enter date of issue]

**Figure 4-6-5E. GACAR Part 133 Motion Picture and Television Operations Manual Development Guide**

Each motion picture and television operation manual must contain at least the following items, although it is not restricted to these items.

**1. Operator Organization.**

**2. Operator Name, Address, and Telephone Number of Applicant.**

**3. List of Pilots to Be Used During the Filming, Including Their Pilot Certificate Numbers.**

This information may be placed in the plan of activities. The list must include special pilot authorizations or endorsements (e.g., aerobatic or external load), if applicable.

**4. List of Aircraft by Make, Model, and Serial or Registration Number.** This information shall be placed in the plan of activities.

**5. Distribution and Revision.**

(a) Procedures for revising the motion picture and television operation manual to ensure that all manuals are kept current. A list of effective pages may be appropriate.

(b) Revisions for the accepted motion picture and television operation manual should be forwarded to the POI at least 15 days before the proposed effective date.

**6. Persons Authorized.** The motion picture and television operation manual must include procedures to ensure that no persons, except those persons consenting to be involved and necessary for the film production, are allowed within 500 feet of the filming production area. This

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provision may be reduced to no less than 200 feet in the event that a suitable, ELOS can be achieved. An ELOS may be determined by evaluation of the filming production area and the degree of terrain features, buildings, etc., that will provide a safety barrier to observers.

**7. Area of Operations.** The motion picture and television operation manual must define the area (e.g., city, state, or states) that will be used during the term of the authorization.

**8. Plan of Activities.** The motion picture and television operation manual must include procedures for the submission, 3 days prior to scheduled filming, which includes a written plan of activities, to the responsible POI having jurisdiction over an area of proposed filming. At the discretion of the POI, the 3-day notification may be waived. Justification of the exception to the 3-day requirement is needed. The manual shall indicate acknowledgment of the requirement for GACA acceptance of the plan of activities prior to beginning filming operations. The plan of activities must include at least the following:

- (a) Dates and times for all flights.
- (b) Name and phone number of person responsible for the filming production event.
- (c) Make, model, and serial number or registration number of aircraft to be used and type of airworthiness certificate, including category.
- (d) Names and certificate numbers of pilots involved in the filming production event.
- (e) A statement that permission has been obtained from property owners and/or local officials to conduct the filming production event.
- (f) Signature of waiver holder or a designated representative.
- (g) A general outline or summary of the flight activity schedule, including maps or diagrams of the specific filming location, if necessary.

**9. Permission to Operate.** The motion picture and television operations manual shall specify requirements and procedures that the authorization holder will use to obtain permission from property owners and/or local officials (e.g., police, and fire departments) as appropriate for the conduct of all filming operations when using the waiver.

**10. Security.** The manual must specify the method of security that will be used to exclude all persons not directly involved with the operations from the location. This should also include procedures that will be used to stop activities when unauthorized persons, vehicles, or aircraft

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enter the Operations Area, or for any other reason, in the interest of safety.

**11. Briefing of Pilots and Production Personnel.** Procedures must be included to brief personnel on the risks involved, emergency procedures, and safeguards to be followed during the filming production event. Personnel will also be briefed on any additional provisions that may be issued by the responsible POI, including the location of boundaries or any other time limits.

**12. Certification/Airworthiness.** Procedures must be included to ensure that inspections will be in accordance with General Authority of Civil Aviation (GACAR) parts 43 and 91 and applicable operating limitations. The aircraft to be used may be certificated in any category, including experimental, provided the requirements of part 91, §§ 91.7, 91.13, and 91.301 are met.

**13. Pilot Personnel—Minimum Requirements** The pilot or operator must establish and specify the minimum pilot requirements. Minimum requirements should meet or exceed the following:

(a) A current GACA Commercial Pilot Certificate with ratings appropriate to the category and class of aircraft to be used under the terms of the waiver.

(b) At least 500 hours logged in as pilot in command (PIC) and 20 hours as PIC in the aircraft type.

(c) A minimum of 100 hours in the category and class of aircraft to be used.

(d) A minimum of 5 hours in the make and model (M/M) aircraft to be used under the waiver.

(e) In the event that the 1,500-foot minimum standard contained in § 91.417(e) is to be waived, the pilot performing aerobatic maneuvers must hold a GACA Form 8710-7, Statement of Aerobatic Competency for the operations to be performed.

(f) In the event the operations to be conducted contains elements of an external-load Operations, whether fixed-wing or rotary operations, pilots used in the operations shall be qualified. This qualification may be obtained through a test of knowledge (which may be oral or written) and/or skill. A GACA Flight Operation Inspector or another company pilot approved by the POI who is qualified to carry loads externally will give the test(s). These tests will be similar to GACAR part 133 requirements and cover the following subjects:

- Steps to be taken before starting operations, including a survey of the flight area. Proper method of loading, rigging, or attaching the external load.

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- Aircraft performance capabilities under motion picture operating procedures and the Aircraft Flight Manual (AFM).
- Proper instructions for flight and ground crew personnel.
- AFM, pilot's operating handbook (POH), or a Rotorcraft-Load Combination Flight Manual (RLCFM), and limitations, if appropriate.

**14. Communications.** The motion picture and television Flight Operations Manual (FOM) must contain procedures to provide communication capability with all participants during the actual Operations and filming. The applicant can use oral, visual, or radio communications as long as it keeps the participants continuously apprised of the current status of the operations.

**15. Incidents/Accident Notifications.** The motion picture and television FOM must contain procedures for notification and reporting of incidents / accidents.

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**Figure 4-6-5F. Sample Letter of Disapproval of an Application.**

GACA Letterhead

[Date]

[*Applicant's Name and Address*]

Dear [*Applicant's Name*]:

This letter is to inform you that the application submitted on [indicate date] has been disapproved for the following reasons:

[*list all the reasons for rejection*]

Please make the corrections noted and return them to this office within 15 days of receipt of this letter. If you have any questions or comments, please feel free to contact this office at the following telephone number [indicate number].

Sincerely,

[*Principal Operations Inspector's Signature*]

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**Figure 4-6-5G. Sample Letter of Non-acceptance of a Flight Operations Manual**

GACA Letterhead

[Date]

[Operator's Name and Address]

Dear [Operator's Name]:

This letter is to inform you that the motion picture and television Flight Operations Manual (FOM) submitted on [indicate date] has been determined unacceptable for the following reasons: [List all reasons for non-acceptance]. Please make the corrections noted and resubmit to this office within 15 days of receipt of this letter. If you have any questions, please feel free to contact this office during regular business hours at the following telephone number [indicate number].

Sincerely,

[Principal Operations Inspector's Signature]

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**Figure 4-6-5H. Sample Letter of Acceptance of a Flight Operations Manual**

GACA Letterhead

[Date]

[Operator's Name and Address]

Dear [Operator's Name]:

This letter is to inform you that the motion picture and television Flight Operations Manual (FOM) submitted on [indicate date] has been accepted. If you have any questions, please feel free to contact this office during regular business hours at the following telephone number [indicate number].

Sincerely,

[Principal Operations Inspector's Signature]

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**Figure 4-6-5J. Sample Letter of Reminder**

GACA Letterhead

[Date]

[Operator's Name and Address]

Dear [Operator's Name]:

This letter is a reminder that a plan of activities must be submitted, as outlined in your accepted motion picture and television Flight Operations Manual (FOM), to the responsible your GACA POI. The plan of activities must be submitted at least 3 days before actual filming begins. If you have any questions or comments, please feel free to contact this office at the following telephone number [indicate number].

Sincerely,

[Principal Operations Inspector's Signature]

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**Sample GACA Form 8710-7, Statement of Aerobatic Competency (SAC)**
**Statement of Aerobatic Competency (SAC) GACA Form 8710-7**

Operator: \_\_\_\_\_ GACA Flight Operation Inspector: \_\_\_\_\_

Certificate Type/No: \_\_\_\_\_

Signature: \_\_\_\_\_

Phone: \_\_\_\_\_

Email: \_\_\_\_\_

SAC Issuance: \_\_\_\_\_

Phone: \_\_\_\_\_

SAC Proficiency Expiration: \_\_\_\_\_

Email: \_\_\_\_\_

AUTHORIZED AIRCRAFT	AUTHORIZED AIRCRAFT CATEGORY	ALTITUDE LEVEL	SHOW LINE CATEGORY	ENDORSEMENTS: ALL AIRCRAFT CATEGORIES	EXPIRATION DATE – AIRCRAFT CATEGORY/LEVEL/ENDORSEMENT
North American p-51 Mustang	Category C: Piston Warbird Aerobatics	Level 1: Unrestricted	CAT II	<input type="checkbox"/> Rolls Only <input type="checkbox"/> Aerobatics: <input type="checkbox"/> Solo <input type="checkbox"/> Formation <input type="checkbox"/> Dynamic Maneuvering <input type="checkbox"/> Solo <input type="checkbox"/> Formation <input type="checkbox"/> Night Shows <input type="checkbox"/> Pyro <input type="checkbox"/> Wing Walking <input type="checkbox"/> Inverted Ribbon Cut <input type="checkbox"/> Dog fight <input type="checkbox"/> Comedy <input type="checkbox"/> Car to plane transfer <input type="checkbox"/> Aerial Transfer <input type="checkbox"/> Car-top landing <input type="checkbox"/> Circle the Jumpers <input type="checkbox"/> Other	
	Jet Warbird Aerobic		CAT I		
	Piston Warbird Aerobatic				
					I understand that this statement of competency does not authorize deviation from GACAR Part 91 except as defined in a waiver and the terms of a Special Provision contained in a Certificate of Waiver (GACA Form 7711-1) for an Airshow
					<b>PILOT SIGNATURE</b> _____
					<b>DATE</b> _____

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### Sample Form 26-0307, Statement of Aerobatic Competency (SAC)

#### Statement of Aerobatic Competency (SAC)

Pilot:

License Number:

Issue Date:

Proficiency Expiration:

Authorized Aircraft	Aircraft Category	Minimum Altitude	Min. Lateral Distance	Activity	Category Expiration
Boeing Stearman – All variants	Sport Aerobatic/ Acrobatics sportives	Level 4	Category 3	- Rolls/Tonneaux - Aerobatics/Acrobaties - Solo - Formation - Night - Pyro - Wing Walking - Inverted Ribbon Cut - Dog fight - Comedy - Circle the jumpers - Car to plane transfer/ Transfer auto-avion - Car-top landing - Other	
	Jet Warbird Aerobatic				
	Piston Warbird Aerobatic				

Note: This document provides no privileges and its meant for information purposes. The holder is only authorized to perform if specifically identified on a Special Flight Operations Certificate (SFOC) or a Certificate of Waiver for an Air show for an event and to the altitude and the maneuvers specified in that SFOC.

Issuing Inspector's name and signature	Pilot's signature
Chief, Flight Standards	

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**VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

**CHAPTER 7. FLIGHT CREW TRAINING PROGRAMS AND AIRMEN  
QUALIFICATIONS FOR PART 125**

**Section 1. TBD**

**NOTE:** This guidance to be developed at a later date.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 8. PART 141 ADMINISTRATION**

##### **Section 1. General Information for Part 141 Related Tasks**

###### **4.8.1.1. GACA ACTIVITY REPORT (GAR).**

A. 1220

**4.8.1.3. GENERAL.** This section provides guidance to General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) in their understanding of as well as their review and certificate oversight of a General Authority of Civil Aviation Regulation (GACAR) Part 141 pilot school.

**A. Authority.** GACAR Part 141 prescribes rules governing the operation of pilot schools. As used in this chapter, “pilot school” means either a provisional pilot school or a pilot school. Where a requirement applies only to a provisional pilot school, the term “provisional pilot school” is used. The differences between a provisional pilot school and a pilot school are discussed briefly in the following paragraphs.

###### **B. Definitions.**

- 1) *Certification Course.* A certification course in a GACAR Part 141 school is a training course taken to achieve a certificate or rating and is normally accomplished by a student from “zero time” to completion.
- 2) *Certificated Pilot School.* A certificated pilot school is a school that meets the pertinent requirements of Part 141, Subparts A through H.
- 3) *Curriculum.* A curriculum is a set of courses in an area of specialization offered by an educational institution. A curriculum for a pilot school might include courses for private pilot airplane and instrument ratings.
- 4) *Special Curriculum.* A special curriculum course is a course of pilot training not listed in the appendixes of GACAR Part 141. Under GACAR § 141.109, both a pilot school and a provisional pilot school may apply for a special course of airman training provided the course contains features that can be expected to achieve a level of pilot competency

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equivalent to the level achieved by the curriculum prescribed in the appendixes of GACAR Part 141. Under GACAR § 141.109, a special course of airman training that utilizes an innovative approach such as advanced training equipment technology (e.g., flight simulation training device (FSTD), aviation training device (ATD), computer-based instruction (CBI), Web-based instruction, etc.) may be approved. If a pilot school (not a provisional pilot school) applies for a special course of airman training with reduced training times, the GACA must approve such course and the pilot school must comply with the provisions set forth in GACAR § 141.107(d) and (e). In accordance with GACAR § 141.107(d)(3) and (e)(4), a pilot school may not be approved for examining authority for a special course of airman training that has been approved for reduced training times.

**NOTE:** A provisional pilot school may not apply for and receive reduced training times for a special course of airman training.

5) *Syllabus (Training).* A systematic building-block progression of learning with provisions for regular review and evaluations at prescribed stages of learning. The syllabus defines the unit of training, states by objective what the student is expected to accomplish during the unit of training, shows an organized plan for instruction, and dictates the evaluation process for either the unit or stages of learning.

6) *Training Course Outline (TCO).* Within a curriculum, a TCO describes the content of a particular course by statement of objectives, descriptions of teaching aids, definition of evaluating criteria, and indication of desired outcome. The TCO is approved by the GACA by way of OpSpecs.

7) *Examining Authority.* The authority granted to a pilot school holding a certificate issued under GACAR § 141.5 to conduct knowledge and/or practical tests of their own graduates for the issuance of pilot certificates and ratings without further testing by the GACA, provided the training course meets the requirements of GACAR Part 141, Subpart F.

8) *Provisional Pilot School.* A school that does not meet the requirements of GACAR § 141.5, but does meet the requirements of GACAR § 141.7.

9) *Satellite Base.* A location other than the main operations base where approved ground or flight training courses are conducted.

### 4.8.1.5. REGULATORY REQUIREMENTS. GACAR Part 141 permits trainees to meet the flight

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experience requirements of GACAR Part 61 with less flight time than training completed outside of the structured environment provided by a pilot school. However, the students must meet all other certification requirements of GACAR Part 61, including obtaining an instructor's recommendation and successfully completing knowledge and flight tests. The reduced time, without a reduction in flight experience, is allowed under GACAR Part 141 because the training is more controlled through supervision and is conducted by experienced instructors.

**4.8.1.7. PROVISIONAL PILOT SCHOOLS.** Initially, pilot schools are certificated under GACAR Part 141 as provisional pilot schools for a period of 24 months. They may be re-certificated as pilot schools when they meet the requirements of GACAR § 141.5(b).

### **4.8.1.9. QUALITY OF INSTRUCTION.**

**A. Without Examining Authority.** Under the provisions of GACAR §§ 141.5(d) and (e), and 141.93, a pilot school must maintain a standard of training of at least 10 students, 80 percent of which must have passed the required test on the first attempt.

**B. With Examining Authority.** A pilot school with examining authority must meet and comply with the requirements of Part 141 Subpart D, specifically GACAR § 141.121.

**C. Content of Tests to Meet Quality of Training Requirements.** The tests must be approved by the GACA and may consist of any test for a pilot certificate or rating, or for an operating privilege appropriate to the course from which the student graduates, or a test to determine competence and knowledge of a completed stage of training.

#### **D. Failure to Meet Quality of Training Requirements.**

1) When a school fails to maintain quality of instruction as required by the regulations, it is considered the basis for suspension or revocation of the pilot school certificate held by that school.

2) If a school fails to maintain quality of training, an Inspector should review the school's training activities in question to determine the probable cause of the deficiency and take corrective action, including enforcement action.

3) Only the end-of-course tests count when determining the 80 percent quality of instruction pass rate for renewal of a school certificate required by GACAR §141.5(d).

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- a) The intent of GACAR § 141.5(d) is to count only the end-of-course test for calculating the 80 percent quality of instruction pass rate. Per GACAR § 141.5(d), those tests include a knowledge or practical test for a pilot certificate, flight instructor certificate, ground instructor certificate, an additional rating, an end-of-course test for a training course specified in GACAR Part 141, Appendix J, or any combination of those tests. It does not count if it is merely an intermediate phase test.
- b) Only a comprehensive, all-inclusive end-of-course test can be used to meet the requirements of GACAR § 141.5(d), and then, only if the course has examining authority for that portion of the course (i.e., knowledge or practical test that was accomplished under an approved examining authority). The end-of-course test or final phase test in a course of training that is not accomplished under an approved examining authority cannot be used to meet the requirements of GACAR § 141.5(d). The provisions of GACAR § 141.5(d) require that the tests used as counters must be knowledge or practical tests that are accomplished for a pilot, flight instructor, ground instructor, an additional rating certification or an end-of-course test for a GACAR Part 141, Appendix J course. Therefore, the end-of-course tests that are used as counters under GACAR § 141.5(d) (for meeting the 80 percent pass rate criteria or the 10 graduates quantity criteria) are the end-of-course tests that are approved under GACAR Part 141, Appendix J courses or the comprehensive, all-inclusive end-of-course tests that are approved under an approved examining authority course (i.e., those listed in GACAR § 141.5(d)).
- c) When a pilot school, with or without examining authority, requests progressive phase tests for the end-of-course test, the request must be denied. One of the basic concepts of a pilot school having examining authority is that the issuance of a certificate or rating be given without the need for any further testing by the GACA. However, per GACAR § 141.125(c), “Tests given by a pilot school that holds examining authority must be approved by the GACA and be at least equal in scope, depth, and difficulty to the comparable knowledge and practical tests required under GACAR Part 61.” Requiring a school to administer a comprehensive, all-inclusive end-of-course test enables that test to be counted in meeting the quantity and quality requirements of GACAR § 141.5(d).

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 8. PART 141 ADMINISTRATION**

##### **Section 2. Approve Training Course Outlines for Part 141**

###### **4.8.2.1. GACA ACTIVITY REPORT (GAR).**

- A. 1368 (OP) (Initial)
- B. 1369 (OP) (Added Rating)

**4.8.2.3. OBJECTIVE.** This section provides guidance to General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) in determining if training course outlines (TCO) for a General Authority of Civil Aviation Regulation (GACAR) Part 141 pilot school are acceptable (including initial certification and amendment). Successful completion of this task results in approval or disapproval of a pilot school's TCOs.

**4.8.2.5. GENERAL.** TCO approval may be granted for initial certification of the school, for amendment of a course, or for addition of a course to an existing school certificate. Each course of training requires a separate TCO. The approval of a TCO is accomplished by way of issuance of an operations specification (OpSpec). This authorizes the school to train and certify pilots using that particular course. The addition of or amendment to a TCO for an already certificated school constitutes an amendment of the pilot school certificate held by that school. Definitions of the terms used in this section are located in Section 1 of this chapter.

**A. Authority.** GACAR Part 141, Subpart E describes the requirements for TCOs in detail.

**B. Background.** An applicant for or the holder of a pilot school certificate must obtain approval from the GACA for each course of training to be given by that school.

1) A careful review of each TCO or special curriculum submitted for approval must be made to ensure compliance with the provisions of GACAR Part 141, Subpart E and to ensure that the TCO reflects appropriate completion standards.

2) A pilot school may use standards higher than those specified by the GACA; but not less than those standards.

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- 3) The actual content of a TCO is outlined in GACAR § 141.107 and the appropriate Part 141 Appendix for that rating.
- 4) Each TCO must support in full the syllabus on which it is based. The school must be able to show that it has the appropriate facilities, aircraft, and personnel, and is able to conduct training as described in the TCO.

### **4.8.2.7. EVALUATION OF A TCO.**

**A. Initiation.** The initial request for GACA approval of a TCO comes from an existing pilot school or applicant seeking certification as a GACAR Part 141 pilot school. Approval of an amendment or addition to a TCO is accomplished in the same manner as an original approval.

**B. Course Time Parameters.**

- 1) The appendixes of GACAR Part 141 prescribe the minimum time requirements for each TCO syllabus. However, GACAR § 141.107(d) permits a pilot school to request and receive initial approval for a period of not more than 24 calendar months for any of its training courses that do not meet the minimum ground and flight training time requirements of the GACAR, provided the provisions of § 141.107(d) are met.
- 2) GACAR § 141.107(e) permits a certificated pilot school to request and receive final approval for any of the training courses of Part 141 without specifying the minimum ground and flight training time requirements of GACAR Part 141, provided the conditions of § 141.107(e) are met.
- 3) Additionally, GACAR § 141.109 permits a pilot school or provisional pilot school to apply for approval to conduct a special course of airman training for which the appendixes of GACAR Part 141 do not prescribe a curriculum. This is permitted only if the applicant shows that the training course contains features that could achieve a level of pilot proficiency equivalent to that achieved by a training course prescribed in the appendixes of Part 141 or the requirements of GACAR Part 61.

**C. TCO Content.** Under GACAR § 141.107(a), each TCO must:

- 1) Have sufficient content to meet the minimum curriculum requirements of the appropriate appendix to GACAR Part 141.

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2) Describe the following:

- a) The room used for ground school training, including size and maximum number of students that may be instructed in the room at one time.
- b) The type of audiovisual aid, projector, tape recorder, mockup, aircraft component, and other special training aids used for ground training.
- c) Each flight simulation training device (FSTD) used for training.
- d) The type of aircraft, including any special equipment, used for each phase of instruction.
- e) The aerodromes where training flights originate, to include the facilities and pilot briefing areas that are available for use by the students and operations personnel at each of those aerodromes.

3) Include the minimum qualifications and ratings for each instructor who gives ground or flight training.

4) Include a training syllabus for each course of training that provides the following:

- a) The prerequisites for enrolling in the ground and flight portion of the course that include the pilot certificate and rating (if required by this part), training, pilot experience, and pilot knowledge;
- b) A detailed description of each lesson, including the lesson's objectives, standards, and planned time for completion;
- c) A description of what the course is expected to accomplish with regard to student learning;
- d) The expected accomplishments and the standards for each stage of training; and
- e) A description of the checks and tests to be used to measure a student's accomplishments for each stage of training.

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**D. Training Course Syllabus Content.** Each TCO must contain a training syllabus that builds on each phase to provide a progression of learning, with provisions for regular review and evaluation at prescribed stages. Each TCO must:

- 1) Include a training syllabus in a format similar to that used in the current edition of the Federal Aviation Administration (FAA) Advisory Circular (AC) 141-1, "Pilot School Certification", Appendix A, as amended.
- 2) Contain any prerequisites necessary for enrollment in the course, such as minimum pilot certificates and ratings, training, pilot experience, special knowledge, and the required class of medical certificate.
- 3) Contain a description of each lesson, including its objectives and standards, and the measurable unit of student accomplishment or learning to be derived from the lesson or course.
- 4) Include stages of training and the completion standards for each stage. Course, stage, and lesson objectives must be stated in relation to the performance expected of the student.
- 5) Ensure that each course, stage, lesson objective, and completion standard meet the following general criteria:
  - a) Overall, objectives must describe what students are expected to know or are able to do at the end of a particular course, stage, or lesson. Objectives must be stated in terms of desired student learning outcomes.
  - b) Course objectives must state in broad terms the knowledge and skill goals to be reached by the student at the end of the course.
  - c) More limited stage objectives must state desired student goals in specific areas of knowledge and skill.
  - d) Consistent with the objective of the stage and course, lesson objectives must clearly specify the desired student outcomes for each lesson.

**E. Assessing Course Content.** The content must identify the specific subject matter that will be taught to develop the student's knowledge and skills necessary to meet the course, stage, and

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lesson objectives and completion standards.

- 1) The content must support the objectives, be arranged in a logical sequence, and be attainable within the estimated stage and course times.
- 2) To accommodate for individual learning differences and other situations that may arise, reasonable variances in the timeframe should be considered when determining the adequacy of the estimated timeframes of lessons, stages, or courses.

**F. Analysis and Review of Objectives, Content, and Completion Standards.** The Inspector should review each training syllabus to ensure that it conforms to the various operational training areas and other requirements of.

- 1) The course, stage, and lesson content must provide adequate instruction to obtain the knowledge and skills prescribed in the appropriate GACAR Part 141 appendix.
- 2) The scope of knowledge, procedures, and maneuvers that each lesson includes is left to the discretion of the school. In no case, however, may the completion standards be less than those prescribed in the school's approved training course.
- 3) The completion standards must state the observable, measurable level of knowledge and skill required at the end of the course, stage, or lesson. These standards must be consistent with the objectives.

**G. Commercially-Developed Training Syllabus.** A certificated GACAR Part 141 pilot school normally develops its own course of training. There are, however, commercially-developed training syllabuses available for use by Part 141 pilot schools. A GACAR Part 141 pilot school may elect to purchase a commercially-developed syllabus and present it to the GACA for approval. The GACA completes the approval process in the same manner as it would for a syllabus developed and submitted by the school. When evaluating the school's commercially-developed syllabus, the Inspector must determine whether the school fully understands the objectives and standards of the commercially-developed syllabus and if the school will be able to fully comply with it.

- 1) Before approving a TCO that contains a commercially-developed syllabus, the reviewing Inspector should take whatever action is necessary to ensure such understanding, and record these actions in the GACA's school file.

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- 2) Carefully review the commercially-developed training syllabus to determine whether the school is able to provide the training in the manner described in the syllabus, and whether the syllabus completely supports the curriculum.
- 3) A pilot school may use a commercially-developed syllabus once it is approved by the GACA. Any subsequent modifications to the commercially-developed syllabus must be approved by the GACA before the school may use them. Pilot schools should be alert to changes in the course content made by the producers of commercial syllabuses.
- 4) The approval of a pilot school's TCO, whether self-produced or purchased commercially, rests solely with the GACA.

**H. Contract Training.** If a training contractor is used, the Inspector should verify that the contractor can provide the training specified in the TCO. The applicant may adapt a syllabus already in use by the contractor. If this syllabus is not already GACA-approved, it must be approved following standard procedures.

**I. Testing.** The training syllabus must contain a description of the tests and checks used to measure a student's accomplishment at each stage of training. The applicant must submit copies of each written stage, the final test, and the TCO.

- 1) During the development of a training syllabus, ground training and flight courses must include an appropriate number of stage tests.
- 2) The conduct of stage tests is the responsibility of the chief instructor for the particular course of training. The chief instructor may authorize this stage check to be given by an assistant chief instructor or any other fully qualified instructor employed by the pilot school. However, the chief instructor, assistant chief instructor, or a designated examiner instructor must give the final check.
- 3) The student training records must retain test results to show the student's accomplishments in the enrolled course.
- 4) The GACAR Part 141 appendixes allow a certain amount of the time acquired during stage and final tests to be credited toward the ground training and flight time required by the particular curriculum.

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### 4.8.2.9. SPECIAL CONSIDERATIONS.

**A. Flight Crew Training Devices.** The training syllabus must clearly state the full extent to which an approved training course will use a training device. The training syllabus must also define the learning outcomes. This is necessary to provide the instructor with proper guidance and give the GACA a baseline from which to judge the adequacy of the trainer to be used. GACAR § 141.65 prescribes the requirements for FSTDs and ATDs that may be used to obtain the maximum flight training credit allowed for training devices in an approved pilot training course. The GACA is responsible for evaluating and approving FSTDs and ATDs under GACAR Part 60.

- 1) Approval of the TCO must be based on the ability of the FSTD or ATD to provide effective training for the particular airplane.
- 2) A pilot school may submit a special curriculum under GACAR § 141.109 that exceeds the permitted time usages for curricula prescribed in the appendixes to GACR Part 141. When a GACAR § 141.109 special curriculum contains simulation time that exceeds the permitted time usages for FSTDs and ATDs only that time permitted by the appropriate appendix of GACAR Part 141 may be credited/logged for the furtherance of a pilot certificate.

**B. Special Curriculums.** A pilot school or a provisional pilot school may apply for approval to conduct a special course of pilot training for which a curriculum is not contained in the appendixes of GACAR Part 141. Such special curriculums must contain features that can be expected to achieve a level of pilot competency equivalent in scope and depth to that achieved by the curriculums prescribed in the Part 141 appendixes.

- 1) To apply, the original and two copies of a proposed special curriculum must be submitted to the GACA along with a cover letter requesting GACA approval at least 60 days before the training is scheduled to begin.
- 2) Review, approval, or denial must be accomplished by the GACA within 30 days to allow the school sufficient time to develop a TCO based on the requested special curriculum.

**C. Part 141, Appendix J - Special Preparation Courses.** The GACA established criteria in GACAR Part 141, Appendix J for special preparation courses, similar to those courses that existed in GACAR Part 141, Appendix G. These proposed courses are similar to test preparation courses, but expand the concept of specialized courses. Appendix J includes:

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- 1) *Pilot Refresher Course.* The course requires 4 hours of ground training and 6 hours of flight training. See Appendix J for the requirements.
- 2) *Flight Instructor Refresher Course.* The flight instructor refresher course consists of at least 16 hours of ground training, flight training, or any combination of ground and flight training. When approving these courses, the GACA will use GACAR Part 141 for general guidance on approving these flight instructor refresher courses. Some schools may act in accordance with GACAR § 141.107(d) and (e), which allows them to submit courses without specifying the minimum ground and flight training time requirements of GACAR Part 141. Any school that submits a course for approval without specifying the minimum ground and flight training time requirements of GACAR Part 141 may not use its own on-staff examiners. Approval of a course with less than 16 hours is dependent on an 80 percent overall pass rate of its graduates for the school to retain its GACAR Part 141 certificate (see GACAR § 141.107(e)(2)). The pass rate must be based on the graduate passing on the first attempt at the test that is given by an outside examiner or a GACA operations Inspector. Otherwise, the GACAR Part 141 school could lose its Part 141 approval.
- 3) *Ground Instructor Refresher Course.* See Part 141, Appendix J for the required contents of this course.
- 4) *Special Operations Courses.* As examples, these courses may include performance-based navigation, RVSM, pipeline patrol, shoreline patrol, and aerial photography. The requirements of each course are not specifically designated. These courses are to provide the incentive and flexibility for GACAR Part 141 pilot schools to develop specialized courses and improve business opportunities.

**4.8.2.11. ASSESSMENT RESULTS.** Guidance for the initial certification of a GACAR Part 141 pilot school is contained in eBook Volume 3, Chapter 7, The Certification Process for Part 141.

**A. Approval for an Initial Certification.** When an application for original certification is evaluated, the TCO detailing the specifics of each course is approved during the Document Compliance Phase. The GACA certification team must be satisfied that the syllabus adequately measures student accomplishments at each stage of training. A chief instructor must be approved for each course of training (see Section 3 of this chapter, Conduct a Chief/Assistant Chief Instructor Practical Test). When all certification requirements are met, approval is indicated on

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the application as detailed in this chapter. The TCO is approved by the certification team for an initial certification and by the POI for a renewal or amendment.

**B. Additions to Current Pilot School Certificate.** To add a course of training, the applicant must develop a TCO for the new course. The applicant will have to meet the same requirements as those for initial certification. However, a certification team need not be designated. An Inspector assigned to review the application for amendment and the accompanying TCO will approve the new TCO.

**C. Disapproval of TCOs.** When a TCO is disapproved, the school may not train for that particular rating. The school is eligible to reapply when it corrects the discrepancies.

### 4.8.2.13. PREREQUISITES AND COORDINATION REQUIREMENTS.

**A. Prerequisites.** This task requires knowledge of the regulatory requirements of GACAR Part 141 and qualification as an Inspector (Operations).

**B. Coordination.** This task may require coordination with the Inspector (Airworthiness) and other Inspectors who may have evaluated associated flight crew training devices, if applicable.

### 4.8.2.15. REFERENCES, FORMS, AND JOB AIDS.

#### A. References.

- GACAR Parts 1, 60, 61, 91, 141, and other appropriate regulations
- FAA Advisory Circular AC 141-1, Pilot School Certification, as amended
- Pilot school's current TCOs (if an amendment)
- Volume 15, Chapter 7

#### B. Forms.

- Application for Pilot School Certificate

#### C. Job Aids.

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- Figure 4.8.2.1, Letter Disapproving Special Curriculums or TCOs

### **4.8.2.17. PROCEDURES.**

**A. GAR.** Upon receipt of an original and two copies of each proposed TCO, open GAR.

**B. Application Review (Amendments Only).** Review the application for completeness and accuracy.

- 1) If the application is not complete or accurate, advise the applicant how to correct it. If necessary, confirm in writing, and include a reasonable suspense date for submission of a new application (see Figure 4.8.2.1).
- 2) If the application is acceptable, proceed with the TCO review.

### **C. TCO Review.**

- 1) Ensure that each TCO contains at least the following:
  - a) A statement indicating which curriculum in GACAR Part 141 or the name of the special curriculum upon which the TCO is based.
  - b) A description of each room used for ground training, including its size, location, and the maximum number of students that may be instructed in the room at one time.
  - c) A description of each type of audiovisual aid, projector, tape recorder, mockup, aircraft component, and any other special training aid to be used for ground training.
  - d) A description of each FSTD or ATD used for instruction, in sufficient detail that the Inspector can readily determine if the device may be used for the pilot training credit requested.
  - e) A list of the aerodromes where training flights originate.
  - f) A description of school facilities, including pilot briefing areas available for use by the students and operating personnel at each of the originating aerodromes.
  - g) A description of the type (make and model) of each aircraft, including any special

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equipment used for each phase of instruction.

- h) The name of each chief instructor and assistant chief instructor designated for the course.
  - i) The minimum qualifications and ratings for each instructor who will instruct in ground or flight training.
- 2) Check the qualifications of the chief instructor (and assistant chief instructor, if applicable), proposed for each TCO.
- a) If the chief instructors are qualified per GACAR § 141.51, proceed with the chief instructor practical test.
  - b) If the chief instructor is not qualified, inform the applicant that the TCO cannot be approved until a qualified candidate is offered. Establish a date for submission of the TCO with the new candidate's name and qualifications.
- 3) If an Inspector (Airworthiness) is not available, inspect the aircraft to be used in the practical test to determine if it complies with GACAR §§ 141.63 and 141.139.

**D. Conduct A Chief Instructor Practical Test (See Section 3 of this Chapter, Conduct a Chief/Assistant Chief Instructor Practical Test).** Conduct Chief Instructor/Assistant Chief Instructor Practical Test-Skill Portion.

**E. Approve TCO.** The issuance of a TCO is accomplished through issuance of the appropriate OpSpec and is added to the list of approved TCOs. The addition of or change to a TCO is an amendment to the pilot school's certificate; however, since it is accomplished via an OpSpec, it does not require a reissuance of that certificate, only a new list of approved courses. An amendment to an existing TCO does not require an amendment to the school certificate or a new OpSpec.

**F. Disapprove TCO.**

- 1) If the content of the TCO is incorrect, indicate how to correct the TCO. Set a suspense date for submission of a corrected TCO.

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2) If the TCO is disapproved because the chief instructor candidate failed the practical test, follow the procedures in Section 3 of this chapter.

**G. GAR.** Close GAR.

**4.8.2.19. TASK OUTCOMES.** Completion of this task results in one of the following:

- A.** A new pilot school certificate is issued with a list of approved courses for initial certification or a renewal is valid until the date as endorsed on the certificate. Or, if a rating is added to a current certificate, the new certificate retains its original expiration date.
- B.** A record is created and placed on file consisting of a letter notifying the applicant of denial of the new rating and an indication of the return of all original documents to the applicant.
- C.** A letter indicating termination of the approval process at the applicant's request.

**4.8.2.21. FUTURE ACTIVITIES.** Review the TCO during any future surveillance of the school.

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**Figure 4.8.2.1. Letter Disapproving Special Curriculums or TCOs**

[GACA Letterhead]

[Date]

[Name - Pilot School President]

[Name - Applicant Pilot School]

[Address- Applicant Pilot School]

Dear [Name - Pilot School President]:

We are unable to approve your [name of course] training course outline (TCO) [or special curriculum] for the following reasons:

[List reasons]

All other TCOs (and/or special curriculums) have been approved and are reflected in your list of approved courses. If you wish to continue to seek approval for the [above course or special curriculum], you may reapply when appropriate corrections have been made.

Sincerely,

[Inspector's signature]

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 8. PART 141 ADMINISTRATION**

##### **Section 3. Approving Examining Authority for a Part 141 Pilot School**

###### **4.8.3.1. GACA ACTIVITY REPORT (GAR).**

A. 1558 (OP)

**4.8.3.3. OBJECTIVE.** This section provides guidance to General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) in determining whether a pilot school that is applying for knowledge and/or practical (flight) test examining authority meets the requirements outlined in GACA Regulation (GACAR) Part 141, Subpart F. Successful completion of this task results in either issuance or denial of examining authority to that pilot school.

**4.8.3.5. GENERAL.** A pilot school may request practical (flight) test examining authority, knowledge test examining authority, or both for a course of training. GACAR § 141.123 states that “A pilot school holding examining authority may recommend a person who graduated from its course for the appropriate pilot, flight instructor, or ground instructor certificate or rating without taking the GACA knowledge test or practical test...”. If a school does not hold flight test examining authority, final pilot certification is conducted by a GACA Inspector. If a school does not hold knowledge test examining authority, knowledge tests for certificates or ratings must be given by a means acceptable by the GACA.

**4.8.3.7. ELIGIBILITY.** Only the holder of a certificate for a pilot school (not a provisional pilot school) is eligible for an examining authority. In addition to meeting the requirements of GACAR Part 141, Subparts A through C, a pilot school must meet the provisions of GACAR § 141.121 within the preceding 24 calendar-months.

**A. GACAR Requirements for Initial Approval.** A pilot school must meet the following prerequisites to receive initial approval for examining authority:

- 1) The school must complete the application for examining authority on a form and in a manner prescribed by the GACA.
- 2) The school must hold a pilot school certificate and rating issued under GACAR Part 141.

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- 3) The school must have held the rating in which examining authority is sought for at least 24 consecutive calendar-months preceding the month of application for examining authority.
- 4) The training course for which examining authority is requested may not be a course that is approved without meeting the minimum ground and flight training time requirements of GACAR Part 141.
- 5) Within 24 calendar-months before the date of application for examining authority, that school must meet the following requirements:
  - a) The school must have trained at least 10 students in the training course for which examining authority is sought, and recommended those students for a pilot, flight instructor, or ground instructor certificate or rating.
  - b) At least 90 percent of those students must have passed the required practical or knowledge test, or any combination thereof, for the pilot, flight instructor, or ground instructor certificate or rating on the first attempt; and that test must have been given by an Inspector or an examiner who is not an employee of the school.

**B. GACAR Requirements for Renewal.** To retain approval of its examining authority, a pilot school must meet the following requirements:

- 1) The school must complete the application for renewal of its examining authority on a form and in a manner prescribed by the President.
- 2) The school must hold a pilot school certificate and rating issued under GACAR Part 141.
- 3) The school must have held the rating for which examining authority is sought for at least 24 calendar-months preceding the month of application for renewal of its examining authority.
- 4) The training course for which examining authority is requested may not be a course that is approved without meeting the minimum ground and flight training time requirements of GACAR Part 141.

**C. Types of Examining Authority.** Examining authority may be authorized for practical (flight) tests, knowledge tests, or both. Issuance of knowledge test examining authority and flight test

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examining authority are carried out in a similar manner.

**D. Expiration of Authority.** Examining authority expires concurrently with the pilot school certificate on which it is issued. That is, examining authority expires at the end of the 24th month after the month in which the pilot school certificate was issued. Re-application must be made at least 30 days before the expiration date. Examining authority is routinely renewed at the same time the schools certificate is renewed, provided the school meets the requirements of GACAR Part 141, Subpart F.

### 4.8.3.9. INITIATION.

**A. Application.** Application for examining authority is made using the Application for Pilot School Certificate. The Inspector accepts or denies an application on the basis of eligibility, completeness, or accuracy.

### B. Role of the GACA.

- 1) When a pilot school notifies the GACA that it intends to apply for an examining authority for one or more of its approved courses, the GACA should closely monitor those courses.
- 2) After receipt of the application, the GACA should conduct at least 50 percent of any upcoming stage tests. The GACA should accomplish these tests in a timely and practical manner to expedite the issuance of examining authority.

**4.8.3.11. INSPECTION.** After receiving a correctly completed application for examining authority, the Inspector will conduct an inspection of the school to determine if the school continues to meet the requirements for the privilege(s) it already holds. In addition, inspections for specific examining authorities are noted later in this task.

### 4.8.3.13. EFFECT OF EXAMINING AUTHORITY ON THE STUDENT.

**A. Pilot Ground School.** When a student graduates from a ground school course conducted by a pilot school, that student is issued a ground school graduation certificate (GSGC), which is evidence that all required training has been completed and the student is eligible to take the appropriate knowledge test. If that ground school has knowledge test examining authority, that GSGC will be annotated to indicate the knowledge test has been completed and the GSGC will

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be accepted as evidence of meeting the aeronautical knowledge requirements for the pilot certificate or rating sought. Such a GSGC is valid for 24 calendar-months.

- 1) When a GSGC is presented in lieu of an airman knowledge test report, the Inspector or authorized examiner who administers the practical test must make the appropriate entry on the Application for Airman Certificate and/or Rating. The GSGC should be included in the applicant's file.
- 2) When a holder of a GSGC graduates from an appropriate flight course with examining authority, that student becomes an applicant for a certificate or rating. The student must apply for the certificate or rating within 60 days following graduation. If application is not made within this 60-day period, the student must meet all of the applicable requirements of GACAR Part 61 for the certificate or rating sought, including passing the appropriate GACA knowledge test.
- 3) The following are examples of the use of a GSGC issued under examining authority. The GSGC is accepted in lieu of taking the GACA knowledge test for 24 months from the date of ground school graduation.
  - a) Should an applicant who holds a GSGC elect to complete flight training under GACAR Part 61, then that applicant must meet all the certification requirements of Part 61.
  - b) If an applicant who holds a GSGC elects to complete training in a GACA-approved flight course without examining authority, then that applicant must meet the testing requirements of GACAR Part 61.

**B. Certification of Graduates.** Holders of examining authority must be advised that certification stage tests must not be conducted until all other requirements for the pilot certificate or rating have been met, including the passing of the required knowledge examination within the preceding 24 calendar-months.

- 1) A student completing the approved course applies for a certificate or rating by using an Application for Airman Certificate and/or Rating. After the final flight test, the chief instructor for the examining authority course must enter a recommendation on the reverse of the application, indicating the name and number of the pilot school involved and the course completed.

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- 2) The school forwards the students Application for Airman Certificate and/or Rating, complete training record (including GSGC), and Temporary Airman Certificate to the GACA. The training record must include documentation of the student's knowledge test score.
- 3) The GACA reviews the students file and evaluates the training record to determine if the required training has been accomplished. The student's Application for Airman Certificate and/or Rating must be clearly marked "Certificated as a graduate of the examining authority." After examining and approving all the documents in the file, the GACA should review the Application for Airman Certificate and/or Rating, the GSGC, knowledge test score documentation and the Temporary Airman Certificate, and then issue the appropriate pilot certificate or rating. The student's training record is returned to the school. If the Inspector has doubts concerning the student's training record (that is, falsification), the matter should be investigated in accordance with GACAR Part 13, Compliance Enforcement Procedures and Appeals.

### **4.8.3.15. KNOWLEDGE TEST EXAMINING AUTHORITY.**

**A. General.** A pilot school may hold knowledge test examining authority (KTEA) as issued by the GACA under GACAR Part 141, Subpart F. A pilot school may deliver airman knowledge tests only under the provisions of their KTEA. Under KTEA stipulations, a school may deliver exams only to its students, and only for ratings covered by the school's curriculum.

**B. Steps.** Schools wishing to exercise their KTEA by delivering airman knowledge tests must apply to the GACA for authorization under the provisions of GACAR Part 141, Subpart F as follows:

- 1) A pilot school that wishes to obtain KTEA must apply in writing to the GACA.
- 2) Prior to issuing KTEA to a school, a GACA Inspector should conduct an in-person observation of the schools proposed testing facilities and equipment.
- 3) The pilot school must provide the GACA with pertinent facility, equipment, and personnel information.
- 4) The GACA will accomplish a review and approval of knowledge test material to be used by the pilot school for each of its approved course training course outlines (TCOs).

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5) The GACA must provide the applicant pilot school written confirmation of authorization for the school's KTEA, including a list of exams the school is authorized to deliver. The letter in Figure 4.8.3.2 serves to notify the pilot school that the knowledge examining authority has been granted. The issuance of the knowledge test examining authority is accomplished through issuance of the appropriate operations specifications (OpSpec).

**C. Evaluation of Test Performance by the GACA.** All Part 141 pilot schools with knowledge test examining authority will forward copies of each knowledge test administered to the GACA within 5 working days after completion of the test. The test material must identify the questions used and include copies of the answer sheet, question selection sheet, and scoring sheet.

### **4.8.3.17. CONDUCT OF AIRMAN KNOWLEDGE TESTS.**

**A. Knowledge Testing Constraints.** Testing subject matter for knowledge tests administered by a GACAR Part 141 pilot school with KTEA must meet the requirements of GACAR §141.125(c). The school must adhere to the following guidelines when administering knowledge tests for GACA pilot certificates and ratings:

- 1) The school must designate, in writing, one or more individuals who are responsible for applicant registration and the administration of knowledge tests.
- 2) Personnel involved with automated testing (when applicable) must be knowledgeable of the testing software and system and be competent in answering the applicant's questions concerning test registration and administration processes.
- 3) The school must permit only the students enrolled in the TCO curriculum for which the exam is being given to take said knowledge test.

**B. Knowledge Test Administration.** The test administrator is responsible before, during, and after the test to ensure that the following, as well as many items covered in testing security (paragraph 4.8.3.19, below) are accomplished:

- 1) A student must provide positive proof of identification, a permanent mailing address, and documentary evidence of age.
- 2) Information and procedures regarding test titles, test codes, eligibility requirements, authorization requirements, number of questions, and minimum passing scores are properly

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addressed.

- 3) The test administrator must ensure the student uses only those reference materials authorized for use when taking a knowledge test, including assurance that the student is provided with the latest version of the applicable computer testing software and materials (where applicable).
- 4) All students must be continuously monitored during test administration by the test administrator, who must be able to view the applicants at any time, and be aware of all activities in the testing area to prevent possible test compromise. Additionally, visual and video surveillance systems may be utilized in the testing facility at the option of the pilot school and with the approval of the GACA.
- 5) At the end of the exam, the test administrator collects reference materials and any scratch paper from the applicant. The test administrator should check the computer testing supplement (where applicable) for defacement and/or markings before storing it away for future test takers' use.
- 6) Before providing the student with his testing results via the printed airman knowledge test report, the test administrator will mark the report with the school's official seal. The GACA recommends that the test administrator accomplish this through use of a custom embosser or stamp and that the test administrator initial the test report within the imprint of the seal.

### C. Special Policies and Procedures.

- 1) Retesting requirements are outlined in GACAR Part 61, Certification – Pilots, Flight Instructors, and Ground Instructors.
- 2) Procedures for handling knowledge test cheating incidents are outlined in GACAR § 61.27(b).

**D. Remedial Training.** The school must ensure that a student who fails a knowledge test for a pilot certificate or rating is not administered a retest until the student presents a written statement from an authorized instructor of the school certifying that the student has received ground instruction and is competent to pass the retest. Additionally, this information should also be available to the instructor for guidance in remedial study with the student before taking

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the practical test. The pilot examiner giving the practical test should refer to this information and determine whether a student is competent in the areas in which he experienced difficulty on the knowledge test.

**4.8.3.19. KNOWLEDGE TEST SECURITY.** It is essential that school personnel follow strict security procedures to prevent test compromise. Adequate security also ensures that the students enrolled in courses conducted by pilot schools will be tested on knowledge requirements pertinent to the certificates or ratings sought without compromise. All applicant, authorization, and knowledge test result information must be stored in a secured area. Before issuing knowledge test examining authority, the operations Inspector must determine if the storage, transportation, and administration of test materials are carefully controlled.

**A. Automated Testing.** Where computers or other automated means of testing are used:

- 1) The school must own or have exclusive use of the computer equipment used for airman knowledge testing activities.
- 2) Access to testing area computer terminals must be controlled by school staff during applicant registration and test administration processes. Access to unauthorized persons must be prohibited.
- 3) Testing software must be removed from a computer prior to the computer being used for purposes other than knowledge testing. Testing software and computer testing supplements must be stored in a secured area when not in use.

**B. Pilot School Security Procedures.** The Inspector should ensure that pilot schools with examining authority meet their responsibilities in establishing and implementing knowledge test security procedures conforming to those required by this handbook. The pilot school should adhere to the following guidelines when administering final knowledge tests for pilot certificates and ratings:

- 1) Where question selection sheets are used, instructors, students, and the general public will not be allowed to use a question selection sheet for study or discussion purposes or copy any portion of the question selection sheets or supplementary material.
- 2) The school must permit only the students enrolled in the course for which the test is being given to take the knowledge test.

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3) The school must ensure that the students do not mark or deface knowledge test books or supplementary materials. If plotting is required, the school should provide plastic overlays for protection of performance charts.

4) The school test administrator must separate students as much as possible during the administration of knowledge tests and issue different question selection sheets (when used) or different tests to students seated adjacent to each other. Whenever possible, the test administrator will seat students taking tests on the same subject in different parts of the room.

5) The school must ensure that students use only those reference and testing materials provided with the knowledge test. Testing materials may include:

- The proper test and appropriate supplementary material
- An appropriate question selection sheet
- An answer sheet
- A specific number of sheets of scratch paper
- A specific amount of number 2 soft lead pencils

6) Students taking a knowledge test must be monitored by a test administrator to prevent cheating. The following guidelines should be followed:

a) The test administrator:

- Must be present and able to view the students at all times
- Must be aware of all activities in the testing room
- Must be alert for any signs of cheating
- Should not perform any tasks during the test that would divert his attention for an extended period or require his absence from the testing room or monitoring position

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- Should not answer questions that will give a student an indication of a correct answer
- b) If a student appears to be cheating, the test administrator will immediately discontinue the test for that student, save the test, and collect all supplementary test materials that were issued along with any evidence of cheating. If other students are present in the testing room, the test administrator should move the suspected student to a private area to avoid disturbing the other students who are taking tests. The test administrator should advise the student suspected of cheating that further attempts to take any GACA test will not be permitted until suspicion of cheating has been investigated and resolved. The test administrator will immediately notify the appropriate school authority. The school must keep the file on the student suspected of cheating in a locked security area until it is transmitted to the GACA either in person or by registered mail. The school authority will notify the GACA by telephone and present all facts relating to the case. The telephone call will be followed by a letter that includes all evidence related to the matter. The GACA should conduct an initial investigation to determine if the provisions of GACAR § 61.25(b) (2) and (3) apply. If the charge of cheating is resolved in favor of the student, the GACA notifies the school and the student; and, if the test was not completed, arrangements will be made by the pilot school for the student to retake the test.
- c) At the close of the test, the test administrator should collect the test materials and each sheet of scratch paper. The test administrator should check each sheet of scratch paper to determine if there are missing papers on which portions of the test may have been written. In the presence of the student, the test administrator should leaf through the knowledge test book and any supplementary materials to determine that no marks have been made nor pages removed.
- 7) Under no circumstances should a student be permitted to take the same test twice. The school should develop a sufficient number of tests to accommodate retests to prevent this situation.
- 8) The graduation certificate (final knowledge test results) given by a pilot school with examining authority will have a duration of 24 calendar-months.

### C. Pilot School Security Oversight by the GACA. Both before approval of examining authority

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and periodically thereafter, the Inspector should inspect the school to determine if personnel of the school involved in the administration of tests are fully informed about knowledge test security requirements. The Inspector should determine if the school has adequate storage facilities for tests (such as lock-safe files), and whether the school has sufficient space and personnel to separate and monitor students adequately during knowledge test administration. After examining authority has been granted, the Inspector must conduct periodic inspections of the school to ensure compliance in the following areas:

- 1) The school must use security-type envelopes or equivalent means for shipping tests and supplementary materials. When test materials are transported from one location to another, they must be hand-carried by a school official or sent by certified mail. The school must maintain a record of the contents of each test materials package. The sender and receiver will sign this record. The receiver will return the signed record to the sender to indicate receipt of the test materials. This procedure will be followed in shipping test materials between the main training location and a satellite training location.
- 2) Ensure that tests and supplementary materials are securely stored in locked cabinets or spaces. The operations Inspector will also ensure that the opening to the storage area is sufficiently secured with lock bars, hasps, combination locks, and/or security-type key locks.
- 3) Ensure that the school has designated in writing, one or more individuals who are responsible for opening and closing security cabinets or spaces and for monitoring cabinets or areas when open. This may be in addition to the designated testing administrator. Those individuals will be responsible for maintaining inventory records of all tests by title and number. The school must maintain log-out/log-in sheets for use when test materials are removed or replaced in security cabinets or security spaces. This log-out/log-in sheet must include the test title and number.
- 4) Ensure that the school promptly submits any obsolete or damaged test material to the GACA.
- 5) Ensure that the school conducts an inventory of its test materials and maintains an inventory record on a schedule to be determined by the GACA. This ensures early detection of missing test materials. The operations Inspector should require the school to make a complete inventory of its test materials in the event of a forced entry, theft, unsecured

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cabinets left during the absence of responsible personnel, or the misplacement of any test materials. If any test materials are discovered to be missing, the school official discovering the loss must perform the following:

- If possible, determine the identity of the person or persons responsible for the missing test materials and promptly attempt to recover the materials
- Immediately notify the GACA by telephone
- Promptly submit a complete written report to the GACA, relating the circumstances and findings, what effort has been made to recover the test materials, what punitive action (if any) has been taken or is contemplated, and what action is being taken to prevent a recurrence of the problem
  - a) Ensure that if test materials are lost or compromise is suspected, the materials are immediately withdrawn from use and replaced.
  - b) If necessary, the GACA may initiate an investigation in accordance with GACAR Part 13.

### **4.8.3.21. PREREQUISITES AND COORDINATION REQUIREMENTS.**

**A. Prerequisites.** This task requires knowledge of the regulatory requirements of GACAR Part 61 and 141, and qualification as an Inspector (Operations).

### **4.8.3.23. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Parts 1, 61, 91 and 141
- Training course outline (TCO) for each course for which examining authority is requested

#### **B. Forms:**

- Application for Pilot School Certificate

#### **C. Job Aids:**

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- Figure 4.8.3.1, Letter Denying Examining Authority
- Figure 4.8.3.2, Testing Approval Form

**4.8.3.25. GENERAL PROCEDURES.** The following general procedures serve as guidance for Inspectors when processing an applicant who desires to become a GACAR Part 141 Pilot School with examining authority:

**A. Respond to Initial Inquiry.**

- 1) Advise the school to apply for examining authority by completing the Application for Pilot School Certificate.
- 2) Inform the applicant that the Application for Pilot School Certificate must be filled out and signed by appropriate school officials.
- 3) Depending on the applicant's requested authority, explain the requirements of knowledge test examining authority, flight test examining authority, or both.

**B. Open GAR File.**

**C. Review Application.** Upon receipt of the completed Application for Pilot School Certificate, examine it for completeness and accuracy.

**D. Review Inspection History.** Review the GACA file for information from past inspections. Note any unsatisfactory items that might affect issuance of examining authority.

**E. Review Accident/Incident/Enforcement History.** Research the enforcement and accident history and note any problems that might affect issuance of examining authority.

**F. Examine Qualifications.** Based on the information provided in the application, the GACA file and the accident/incident history, determine if the applicant meets the requirements of GACAR Part 141, Subpart F.

- 1) If the applicant is not qualified, inform the applicant of the deficiencies.

**G. Discuss Privileges and Limitations of Examining Authority.** If found qualified, discuss

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with the applicant the proposed procedure for complying with GACAR § 141.125.

**H. Schedule Inspection.** When the application is complete and accurate and the applicant meets the appropriate qualifications, schedule the inspection for knowledge test examining authority and flight test examining authority, or both.

### **4.8.3.27. PROCEDURES FOR KNOWLEDGE TEST (ONLY) EXAMINING AUTHORITY.**

**A. Knowledge Test Examining Authority.** The following procedures are for issuing knowledge test examining authority:

- 1) Ensure that the school has submitted copies of each set of question selection sheets, answer sheets, and supplementary material with the application.
- 2) Determine whether the school uses the appropriate GACA test item banks for each course and test questions for each test for which that school is applying for examining authority.
- 3) Examine the question selection sheets developed by the school and ensure that each selection sheet adequately covers the required subject matter.
  - a) Ensure that the school has developed at least five different question selection sheets for each testing area.
  - b) Determine whether the school uses the GACA-recommended number of questions on selection sheets, and the recommended percentage of questions in each knowledge area, in each testing area for which knowledge test examining authority application is made.
- 4) If any of the school's question selection sheets are deemed unsatisfactory, return all copies of these test materials to the school.
  - a) Along with the question selection sheets, answer sheets, scoring sheets, and supplementary material, return the original application to the applicant.
- 5) If the applicant does not submit corrected question selection sheets or other test materials within 60 days, close GAR. Inform the applicant that it may reapply.
- 6) If the question selection sheets, answer sheets, scoring sheets, and supplementary

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material are satisfactory, note approval of the testing materials in the GACA file.

7) Determine if the school has procedures to support and implement the security concepts discussed in paragraph 4.8.3.19 above.

8) If the applicant is also applying for flight test examining authority, follow the procedures in paragraph 4.8.3.29 below.

**B. Knowledge Test Examining Authority - Automation Testing Method.** Review the letter of application that accompanied the Application for Pilot School Certificate, requesting knowledge test examining authority using automation. In addition to addressing the subjects in Section A above, the letter of application must include the following information:

- The form of automation testing desired, mostly commonly computer-based
- The type, make and model of all computer-related equipment to be used
- A statement that describes the availability of the equipment to the school. A copy of an ownership record, use agreement, or lease should be attached when applicable
- The location of the equipment. If the equipment is portable, the letter must state the locations where approval for is requested for its use
- The schools detailed plan for test administration, grading, and security
- The schools procedures for removing a programmed test and related software from the computer when it is not being used for testing
- A description of the question data bank and how its security is maintained
- Where the correct response for each question can be found
- The total number of questions for each test
- A copy of each question selection sheet, if used, and a description of how they are generated.
- Evidence that the percentage of questions in each knowledge area included in each test is

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the same as the percentage of those questions in the equivalent GACA approved test

- The method by which supplementary information related to the questions will be presented to the student
- A detailed description of the school's plan for randomizing questions, if such a plan will be implemented

**C. Inspection Satisfactory.** If the applicant is seeking knowledge test examining only and the inspection is satisfactory, prepare and issue OpSpecs T1 for the list of approved courses with knowledge test examining authority privileges. See paragraph 4.8.3.31B below.

**D. Inspection Unsatisfactory.** If the applicant does not meet any or all of the required items, advise the applicant in writing of the disapproval and what corrective action the applicant may want to pursue (see Figure 4.8.3.1). Return the application and all documents to the applicant.

**E. Evaluation of Test Performance by the GACA.** Ensure that all Part 141 pilot schools with knowledge test examining authority are forwarding copies of each certification or rating knowledge test that they have administered to the GACA within 5 working days after completion of the test for GACA's evaluation and analysis of test performance. The test material must identify the questions used and include copies of the answer sheet, question selection sheet, and the scoring sheet.

### 4.8.3.29. PROCEDURES FOR FLIGHT TEST (ONLY) EXAMINING AUTHORITY.

**A. Flight Test Examining Authority.** Use the following procedures for the flight test examining authority inspection:

- 1) Verify the qualifications of the chief flight instructor, and/or the assistant chief flight instructor, if applicable, and/or the check instructor, if applicable. Refer to GACAR §§ 141.51, 141.57 or 141.59, as appropriate, to ensure the person who will be conducting the final test is appropriately qualified.
- 2) Inspect training aids, flight simulators, training devices, aircraft, pilot briefing areas, and other facilities for compliance with the school's TCO.
- 3) Evaluate the school's student records to determine if qualifications and standards have

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been satisfactory and that the syllabus has been followed. Refer to GACAR §§ 141.153 and 141.163.

4) When observing the chief, assistant chief, or check instructors conduct the final phase check for a certificate/rating for which examining authority is requested, make sure that the final phase check is equal in scope and content to the practical test as established by the appropriate Subpart to GACAR Part 61 and the appropriate appendix to GACAR Part 141.

### **B. Inspection Satisfactory.**

1) If the applicant is seeking flight test examining authority only and the inspection is satisfactory, prepare and issue the new Pilot School Certificate and a list of approved courses. See paragraph 4.8.3.31B below.

2) If the applicant is seeking both flight and knowledge test examining authority and the inspections are satisfactory, prepare and issue OpSpecs T1 for the list of approved courses with practical (flight) test examining authority privileges. See paragraph 4.8.3.31B below.

**C. Inspection Unsatisfactory.** If the applicant does not meet any or all of the required items, advise the applicant in writing of the disapproval and what corrective action the applicant may want to pursue (see Figure 4.8.3.1). Return the application and all documents to the applicant.

### **4.8.3.31. ISSUING EXAMINING AUTHORITY.**

**A. Operations Specifications.** The GACA must provide the applicant pilot school written confirmation of authorization for the school's examining authority, including a list of exams the school is authorized to deliver. The issuance of the applicable examining authority is accomplished through issuance of the appropriate operations specifications (OpSpec T1), which lists all testing/examining authorizations granted to the school.

### **B. Application.**

1) For knowledge test examining authority only, return one copy each of the selection sheets, answer sheets, scoring sheets, and supplementary material to the school. The GACA-approved stamp, the date, and the operations Inspector's signature should be on the cover sheet only.

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2) File a copy of each of the documents included in the application package in the GACA school file.

**C. Close GAR file.**

**4.8.3.33. TASK OUTCOMES.** Completion of this task results in one or more of the following actions:

- Issuance of examining authority (knowledge and/or practical (flight) tests) for each of the approved courses for which examining authority has been granted by way of OpSpec T1
- A letter denying examining authority
- A letter confirming voluntary termination of the authorization process

**4.8.3.35. FUTURE ACTIVITIES.** Conduct surveillance or inspections at appropriate intervals.

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**Figure 4.8.3.1. Letter Denying Examining Authority**

[GACA Letterhead]

[Date]

[Name and address of school]

Dear [name]:

This letter is to inform you that your application for [knowledge] [flight] examining authority is denied because of the following:

[List specific discrepancies that were reason for denial]

Should you wish to reapply for this examining authority or want to discuss this matter, please contact this office at [telephone number].

[GACA manager signature]

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 8. PART 141 ADMINISTRATION**

##### **Section 4. Conduct a Chief/Assistant Chief Instructor Practical Test**

###### **4.8.4.1. GACA ACTIVITY REPORT (GAR).**

A. 1648 (OP)

**4.8.4.3. OBJECTIVE.** This section provides guidance to General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) in determining whether an applicant for a chief/assistant chief instructor position for a GACA Regulations (GACAR) Part 141 pilot school meets the requirements for that position.

###### **4.8.4.5. GENERAL.**

**A. Chief Instructor.** GACA-approved pilot schools and provisional schools must designate a chief instructor for each course of training. That chief instructor must meet the appropriate requirements prescribed under GACAR § 141.51. A chief instructor may serve as a chief instructor or as an assistant chief instructor for more than one approved course in a school; but does not have authorization to serve as either a chief instructor or an assistant chief instructor at another pilot school or provisional school.

**B. Assistant Chief Instructor.** Each GACA-approved school may designate one or more assistant chief instructors for a course or courses of training. The assistant chief instructor must meet the requirements of GACAR § 141.57 in order to act for the chief instructor in the chief instructor's absence.

**C. Standardization of Assistant Chief Instructors.** For the purposes of this task, if a school proposes to establish an assistant chief instructor position, the task to request and designate the assistant position must be accomplished in the same manner as for the chief instructor.

**D. Check Instructors.** A school may designate a person to be a check instructor for conducting student stage checks, end-of-course tests, and instructor proficiency checks in accordance with GACAR § 141.59.

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### 4.8.4.7. INITIATION.

**A. Chief Instructor and/or Assistant Chief Instructor Designation.** A pilot school designates a chief instructor or assistant chief instructor when the school applies for, and is approved for, certification in a particular course of training (see Volume 3, Chapter 7, The Certification Process for Part 141). The applying pilot school designates by name the chief instructor (and may also designate an assistant chief instructor) in the training course outline (TCO) for each course. Pilot schools may also request approval of a replacement when the chief instructor for a particular course leaves that school's employment, moves to another position, or otherwise causes the position to be vacant.

**B. Approval as Part of TCO Evaluation.** The letter of intent used to apply for initial certification of a pilot school must describe the name and qualifications of each intended chief instructor or assistant chief instructor for every course of instruction (see Section 2 of this Chapter, Approve Training Course Outlines for Part 141).

**C. Examination of the Candidate.** An appropriately qualified Inspector evaluates the chief instructor candidate's background and qualifications, and conducts the practical test.

1) A chief instructor must meet the appropriate experience requirements outlined in GACAR § 141.51. An assistant chief instructor must meet the appropriate experience requirements outlined in GACAR § 141.57.

2) GACAR §§141.51 and 141.57 require every chief instructor or assistant chief instructor respectively to pass both parts of the knowledge and skill test for each course he is designated as chief instructor or assistant chief instructor.

3) For the practical test, the Inspector reviews the appropriate regulations, TCOs, and safety procedures of the school in order to give a comprehensive test. For additional guidance on conducting the practical test, consult GACAR Part 61 and Volume 9, Chapter 2, "Certification of Pilots and Flight Instructors Under Part 61".

4) The knowledge portion of the practical test must include at least the following:

- General teaching methods
- The applicable provisions of the KSA Aeronautical Information Publication (AIP)

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and GACAR Parts 5, 61, 91, and 141

- A discussion of the course of training for which the instructor seeks approval, including training standards, objectives, completion standards
  - The use and understanding of all training aids and devices
  - In the case of a check instructor or test administrator, the use and understanding of all testing and evaluative equipment and materials
- 5) The practical portion of the examination will consist of the applicant's knowledge, skills, and abilities on teaching, testing, and evaluating the areas of operations/tasks for the course of training/pilot certificate level/rating in which the applicant will serve as a chief instructor. For example, if the applicant is applying for a chief instructor position in the school's Private Pilot-Airplane Single-Engine Land (ASEL) course, then the applicant must be tested on teaching, testing, and evaluating areas of operations/tasks for the Private Pilot-ASEL rating. The standards and objectives must be appropriate to the certificates and ratings held by the applicant.

### 4.8.4.9. EXAMINATION RESULTS.

**A. Approval of the Candidate.** When the candidate successfully completes the practical test and meets all other requirements, the Inspector should approve the appropriate TCO which indicates the approval of the applicant as chief instructor.

**B. Disapproval of the Candidate.** If the Inspector determines that the applicant chief instructor's performance does not meet the minimum standards appropriate to the certificate held, he may not approve the TCO until the evaluation and designation of an acceptable chief instructor is completed. Failure of a practical test by an applicant assistant chief instructor is not grounds for disapproval of the TCO. However, the TCO cannot include the assistant chief instructor's name until that assistant chief instructor has passed the practical test.

**C. Retesting.** The applicant who has failed the chief instructor practical test may apply for a retest. If the applicant accomplishes the retest within 60 days, he only needs to repeat the portion of the test that was unsatisfactory. If reexamination is delayed beyond 60 days, the applicant must satisfactorily accomplish the entire test.

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### **4.8.4.11. CHIEF INSTRUCTOR RESPONSIBILITIES.**

**A. Responsibilities.** GACAR Part 141 outlines specific responsibilities for a chief instructor. The need for the chief instructor to fulfill these responsibilities completely and accurately cannot be overstressed. These responsibilities include the following points:

- 1) The chief instructor must properly certify the training records, graduation certificates, and stage and final test reports of airman candidates considered eligible for a certificate or rating.
- 2) When giving a stage or final test, the chief instructor should make “student recommendations,” as discussed in GACAR § 141.53, that are complete and definitive with respect to any additional training needed.
- 3) The chief instructor is responsible for conducting the stage checks and final tests for the particular course of training.
- 4) The chief instructor must continue to update and improve the courses of training for which the instructor is responsible whenever he becomes aware of deficiencies in the course or needed changes in training standards.
- 5) Chief instructors should seek assistance and guidance from GACA Inspectors in the resolution of problems concerning their responsibilities.

**B. Delegation of Responsibilities.** The chief instructor may delegate duties to the assistant chief instructor or check instructor.

**C. Availability-Direct Supervision.** The chief instructor is required to supervise non-certificated instructors directly (see GACAR § 141.145). The chief instructor for a particular course must be available when instruction in that course is given.

- 1) Pilot schools are permitted to use non-certificated ground instructors based on the ground instructor’s specific teaching credentials and qualifications. GACAR § 141.145 requires that instruction by non-certificated ground instructors be given under the direct supervision of the chief instructor or the assistant chief instructor for the course.
- 2) A chief instructor would not be able to supervise non-certificated ground instructors nor be available for consultation if that chief instructor was employed in another job that

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demanded the instructor's presence.

- 3) Certificated ground and flight instructors do not have to be as closely supervised as non-certificated ground instructors. The chief instructor or designated assistant chief instructor will be available at the pilot school or, if away from the premises, by telephone, radio, or other electronic means during the time the instruction is given for an approved course of training.
- 4) Satellite bases require that the chief instructor be "available" for consultation, which can be accomplished by telephone. This ensures that the chief instructor can provide necessary supervision and meet the responsibilities with respect to a school's main base of operation and its satellite base. If the chief instructor is unavailable for consultation, training in relation to the chief instructor's responsibilities must cease until that chief instructor returns, unless these duties have been delegated to the assistant chief instructor. Except for the initial flight check of instructors and final stage check, all duties may be assigned to the assistant chief instructor. Examples of duties that would be appropriate for delegation are the certification of training records and the conduct of stage checks other than the final stage check.

**NOTE:** See subparagraph 4.8.4.11B above for delegation of responsibilities.

**D. Responsibility To Receive Annual Recurrent Training.** At least once every 12 months, each chief instructor and assistant chief instructor must complete an approved syllabus of training consisting of ground or flight training, or both, or an approved flight instructor refresher course (FIRC) (see GACAR § 141.143(c)). This training is not required to receive initial designation as the chief instructor or assistant chief instructor.

**E. Assistant Chief Instructor Responsibilities.** The assistant chief instructor's and chief instructor's responsibilities may be similar, provided the chief instructor has delegated such duties and responsibilities to the assistant chief instructor. Any time the chief instructor delegates' duties, that delegation should be in writing, citing the specific duties delegated, to whom, and for what time period.

### 4.8.4.13. CHANGE OF CHIEF INSTRUCTOR.

**A. Procedures To Follow.** Whenever a pilot school or provisional pilot school makes a change of designation of its chief instructor, that school must do the following:

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- 1) Immediately provide written notification of the change to the GACA.
- 2) Conduct training without a chief instructor for that training course for a period not to exceed 60 days while awaiting the designation and approval of another chief instructor.
- 3) For a period not to exceed 60 days, have the stage checks and end-of-course tests administered by:
  - The training course's assistant chief instructor, if designated, or
  - A GACA Inspector
- 4) After 60 days without a chief instructor, a pilot school or provisional pilot school, as appropriate, must cease instruction in that training course or in all the training courses if just one chief instructor is designated for that entire school. Whether a school must surrender its pilot school certificate and permanently shut down depends on whether the school has a qualified and assigned assistant chief instructor who can competently perform the duties of the chief instructor in the interim and whether the school can present a plan for employing a qualified chief instructor in a reasonable amount of time. The authority to permanently shut down the school and retrieve the school certificate is solely the authority of the GACA.
- 5) Have its certificate reinstated, upon:
  - Designating and approving another chief instructor
  - Showing it meets the requirements of GACAR § 141.37
  - Applying for reinstatement on a form and in a manner prescribed by the GACA

**B. Authority to Examine.** The pilot school may continue to train students under an approved course of training without a chief instructor for a period of 60 days. If the course of training has an assistant chief instructor approved by the GACA, training can continue beyond the 60-day limit; however, at the time of Pilot School Certificate renewal, no TCO may be renewed without a qualified and approved chief instructor. If there is no assistant chief instructor when the school is without a chief instructor, each stage or final test of a student enrolled in that approved course of training must be given by a GACA Inspector (see Section 5 of this Chapter). By referring to the

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approved training syllabus, the Inspector becomes familiar with the specific areas to be tested and with the completion standards for each stage of training being tested. The operator of the school must receive the results of the tests given by the Inspector for inclusion in the appropriate student files.

**C. Maintenance of Records.** The holder of the school certificate is responsible for the maintenance of training records, the issuance of graduation certificates, and the general operation of the school during the transitional period resulting from any change of the chief instructor.

### 4.8.4.15. PREREQUISITES AND COORDINATION REQUIREMENTS.

**A. Prerequisites.** This task requires knowledge of the regulatory requirements of GACAR Part 141, GACA policies, and qualification as an Inspector (Operations).

**B. Coordination.** This task may require coordination with an Inspector (Airworthiness) to ensure airworthiness of the testing aircraft.

### 4.8.4.17. REFERENCES, FORMS, AND JOB AIDS.

#### A. References:

- GACAR Parts 1, 5, 61, 91, and 141
- Appropriate GAR
- The school's TCOs

#### B. Forms.

- Application of Airman Certificate and/or Rating
- GACA Activity Report (GAR)

#### C. Job Aids.

- Figure 4.8.4.1, Chief Flight Instructor Knowledge and Skill Test - Unsatisfactory

### 4.8.4.19. PROCEDURES.

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**A. Task Clarification.** Determine the course for which the task will be conducted.

- 1) For an initial certification, conduct a practical test for all proposed courses.
- 2) For adding a course or changing the chief instructor or assistant chief instructor, conduct the practical test for only the affected course.

**B. Application.** Ensure the applicant has a copy of the Application for Airman Certificate and/or Rating.

**C. TCO Review.** Review the school's procedures in the relevant TCO.

**D. File Review.** Review any appropriate GACA file for pertinent information on the applicant or pilot school.

**E. GAR.** Open GAR file.

**F. Personnel History.** Using office procedures, research the enforcement and accident history of the chief instructor applicant or assistant chief instructor applicant.

- 1) If the applicant has no previous enforcement or accident/incident history, place the enforcement/accident history report in the GACA file.
- 2) If the enforcement/accident history report shows a prior enforcement or accident/incident, evaluate the results to determine if the problems were related to flight training. If the problems do relate to flight training, discuss the findings with the school. If the history is an issue, inform the school that the test cannot be continued until the school submits a different person for consideration. Set a time limit for receipt of the application.
  - a) When the school submits a new name, repeat the review of the new candidate and schedule a date and time for the test.
  - b) If the school does not submit a new application, terminate the task.

**G. Schedule Test.** Schedule the date, time and location for the practical test.

**H. Review Application.** Review the Application of Airman Certificate and/or Rating for

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completeness, accuracy, minimum qualifications, and experience requirements.

- 1) Determine whether the application specifies the courses for which the chief instructor or assistant chief instructor will be tested.
- 2) Determine if the pilot's experience and qualifications meet the requirements of the regulations for the approval requested (GACAR §§ 141.49, 141.51 or 141.57).
- 3) If the application is incorrect or the applicant's qualifications are inadequate, inform the applicant that he lacks the qualifications. Notify the operator and confirm in writing, indicating the specific areas that were inadequate (see Figure 4.8.4.1). Explain to the applicant how to correct the discrepancy, and reschedule the test.
- 4) If the application is correct and the applicant's qualifications meet the regulations, examine the pilot certificates.

### **I. Review Pilot Certificates.**

- 1) Check the pilot and flight instructor certificates for appropriate certificates and ratings.
- 2) If the pilot certificates are inappropriate, inform the applicant that he lacks the necessary qualifications. Notify the operator and confirm in writing, indicating the specific areas of deficiency (see Figure 4.8.4.1). Explain to the applicant how to correct the discrepancy and reschedule the test.

### **J. Inspect Aircraft Used in Test.**

- 1) If an airworthiness Inspector is available, have that Inspector check aircraft documents and current inspections. If not, check the following:
  - The registration certificate
  - The airworthiness certificate
  - The operating limitations
  - The mass and balance information

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- 2) If the aircraft does not have all of the above documents, inform the applicant that the test cannot be conducted until the documents are available for review.
  - a) Notify the operator and confirm in writing that the test cannot be conducted, indicating the specific areas that were deficient (see Figure 4.8.4.1)
  - b) Reschedule the test after the deficiencies have been corrected or reschedule the test with another appropriate aircraft after it has been inspected.
- 3) If the aircraft is airworthy and appropriate for the practical test, conduct the knowledge portion of the test.

### **K. Conduct Chief Instructor/Assistant Chief Instructor Practical Test-Knowledge Portion.**

- 1) Test the chief instructor's or assistant chief instructor's knowledge of at least the following:
  - GACAR Parts 5, 61, 91, 141, and other appropriate regulations relating to the course of training
  - The school's TCOs and/or special curriculums relating to the tested courses
  - The school's prerequisites and enrollment procedures (GACAR § 141.151)
  - The school's training standards, objectives, completion standards, and graduation procedures
  - Aerodromes and aircraft (GACAR §§ 141.61 and 141.63)
  - Simulators and other training devices (GACAR § 141.65)
  - The minimum qualifications and ratings for each instructor used for the particular course of training
  - The safety procedures and practices of the school including their Safety Management System (SMS)
  - The chief instructor's duties and responsibilities (GACAR § 141.53)

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- The means by which the chief instructor will ensure standardized instruction (GACAR §§ 141.143, 141.145, 141.91, and 141.147)
- 2) If the knowledge portion of the test is satisfactory, proceed with the skill portion.
- 3) If the knowledge portion of the test is unsatisfactory, inform the applicant and debrief the applicant on how to correct the deficiency.
- a) Notify the operator and confirm in writing, indicating the specific areas of deficiency.
  - b) Reschedule the test at the operator's request after the deficiencies have been corrected.

### **L. Conduct Chief Instructor/Assistant Chief Instructor Practical Test-Skill Portion.**

- 1) Use the procedures for evaluating a Designated Pilot Examiner (DPE) (see eBook Volume 14, Chapter 4, Section 1, Appoint/Renew a Designated Pilot Examiner). Give special attention to the TCO requirements and the applicant's ability to evaluate not only the performance of students but the performance of other flight instructors as well.
- 2) If the knowledge and skill tests are unsatisfactory, inform the applicant immediately. In addition:
  - a) Notify the operator and confirm in writing that the tests were unsatisfactory, indicating the specific areas of deficiency (see Figure 4.8.4.1).
  - b) After the deficiencies have been corrected, schedule a reexamination at the operator's request.
- 4) If a reexamination is accomplished within 60 days, the operations Inspector may elect to repeat the entire practical test or repeat only that portion of the test that was unsatisfactory. If reexamination is delayed beyond 60 days, the entire practical test shall be repeated.
- 5) In the case of an existing TCO, remind the operator that he may need to change the TCO to reflect the new chief or assistant chief instructor.

### **M. GAR. Complete the GAR.**

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**4.8.4.21. TASK OUTCOMES.** Completion of the task results in either of the following:

- Acceptance of the applicant as either chief instructor or assistant chief instructor for a course of training
- Denial of the applicant for these capacities

**4.8.4.23. FUTURE ACTIVITIES.**

**A. Possible TCO Acceptance.** Possible acceptance of the school's existing or additional TCOs.

**B. Performance Inspection.** According to the established surveillance plan, inspect either the chief instructor's or assistant chief instructor's performance for each course of training for which that instructor is responsible.

**C. Additional Practical Tests.** Conduct additional chief instructor or assistant chief instructor practical tests for other courses or for when the school changes its chief instructor.

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**Figure 4.8.4.1. Chief Flight Instructor Knowledge and Skill Test - Unsatisfactory**

[GACA Letterhead]

[Date]

[School's name and address]

Dear [applicant's name]:

On [date of test], [name of airman] failed to satisfactorily demonstrate the appropriate [knowledge/skills] to be designated as chief flight instructor for [names of courses]. The specific areas that were unsatisfactory are [list unsatisfactory items].

A reexamination of this candidate or of a new candidate may be rescheduled only at your request.

Sincerely,

[Aviation Safety Inspector signature]

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 8. PART 141 ADMINISTRATION**

##### **Section 5. Conduct a Stage Test**

###### **4.8.5.1. GACA ACTIVITY REPORT (GAR).**

###### **A. 1651 (OP)**

**4.8.5.3. OBJECTIVE.** This section provides guidance to General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) in conducting stage tests for a GACA-approved pilot school. These tests can take place during the absence of the regular chief instructor for the school, or at the initiative of the GACA. Successful completion of this task results in an indication of either satisfactory or unsatisfactory on the student's official school record. If the stage test is a certification test, the task could result in the issuance or denial of an airmen certificate or rating.

###### **4.8.5.5. GENERAL.**

**A. Authority.** GACA Inspectors are authorized to conduct pilot school stage tests under GACA Regulation (GACAR) § 141.29.

###### **B. Initiation.**

- 1) Generally, the pilot school contacts the GACA and requests an Inspector to examine aeronautical knowledge and practical test candidates in the absence of the chief instructor. However, a student who is dissatisfied with stage or final test results may request a retest by an Inspector.
- 2) The task also may be initiated by the GACA for spot checking the quality of instruction and training given by the school.

**C. Inspector Qualifications.** The Inspector must be appropriately rated, knowledgeable, and current in the type of aircraft to be used.

**D. Aircraft Preparation.** The school provides the aircraft for the stage test. The student brings the aircraft and engine logbooks so that the airworthiness of the aircraft can be determined.

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**4.8.5.7. STAGE TEST.** The Inspector evaluates the ability of the applicant to perform the required pilot operations described in the training course outline (TCO) for the particular stage of the course being tested. The applicant satisfactorily completes the stage test only when each required operation is successfully performed. The test may be discontinued at any time an operation is failed.

**A. Student Briefing.** The student is briefed on the procedures, objectives, and completion standards for the stage test.

- 1) The student must know how emergencies are simulated. The Inspector and the student must discuss appropriate actions to take in the event of an actual emergency.
- 2) The Inspector and student must clearly understand the pilot-in-command (PIC) responsibilities and the terminology used to transfer control of the aircraft.
- 3) If the test is a certification stage test for a certificate or rating, the briefing must include a review of the knowledge test appropriate to the certificate as well as a review of pilot and medical certificates, as appropriate.

**B. Stage Test Standards.** The appropriate completion standards for the stage test found in the school's TCO are the guides for the certification stage test.

- 1) The student must understand the deficiencies and strengths found during the test and how to correct problem areas.
- 2) In the case of failure, the Inspector should tell the student how to request a retest and whether any successful items may be credited toward the retest.
- 3) The Inspector performing the check completes the student's training record and stage check results.
- 4) The Inspector should advise the chief instructor of the school of the test results.

## 4.8.5.9. PREREQUISITES AND COORDINATION REQUIREMENTS.

**A. Prerequisites.** Requires knowledge of the regulatory requirements of GACAR Parts 61 and 141, GACA policies, and qualification as an Inspector (Operations).

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**B. Coordination.** Requires coordination with the Inspector assigned oversight responsibility of the pilot school and with an Inspector (Airworthiness).

**4.8.5.11. REFERENCES, FORMS, AND JOB AIDS.**

**A. References.**

- GACAR Parts 1, 61, 91, and 141
- Pilot schools' Training Course Outlines (TCOs)
- Appropriate training syllabus
- Appropriate course completion standards

**B. Forms.**

- Application for Airman Certificate and/or Rating

**C. Job Aids.**

- Pilot school stage check forms

**4.8.5.13. PROCEDURES.** After receipt of a request to conduct a stage test, accomplish the following:

**A. Review Initial Information.**

- 1) Determine the course and the stage test to be given.
- 2) Determine the aircraft to be used.
- 3) Request the student's records from the school.
- 4) Advise the school on how to fill out the Application for Airman Certificate and/or Rating. Provide a copy to the student, if necessary.

**B. Conduct Document Review.**

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- 1) Review the lesson objectives and tasks found in the TCO for the particular stage being tested.
  - a) Review all required maneuvers for this stage test.
  - b) Determine the completion standards for each stage test conducted.
- 2) If available, review the pilot's operating handbook for the aircraft to be used on this stage test.
- 3) Review the prerequisites and general procedures for the aeronautical knowledge and practical tests (GACAR §§ 61.25 and 61.27).
- 4) Review the GACA file on the school for previous inspection reports and results of previous stage tests.
- 5) Review the student's records for previous stage test results, noting any areas of weakness.

**C. Schedule Stage Test.** Schedule the date, time, and location of stage test.

**D. Open GAR File.**

**E. Conduct Pretest Briefing.** Brief the student on the procedures, objectives, and completion standards expected for the stage test. Brief the student on methods used to simulate emergency situations and other safety precautions. Determine the PIC's responsibilities and a method for turning over control of the airplane to the ASI.

**F. Review Application.** Review the Application for Airman Certificate and/or Rating for eligibility, completeness, and accuracy.

**G. Review Student File.** Review with the student his training record, medical certificate, any pilot certificate, and so forth, for eligibility, accuracy, currency, completeness, and qualifications.

**H. Conduct Knowledge Test.** Review any knowledge test items or other areas appropriate to this specific stage test.

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- 1) If the knowledge portion of the test is unsatisfactory, make the appropriate entry on the student's official school record.
  - a) Inform the applicant of the failure, and explain how he may correct the problems.
  - b) Discuss the areas failed with the chief instructor and recommend how to improve them.
  - c) If the test was a certification test, issue a Notice of Disapproval and place the application in the approved school's file at the GACA office.
- 2) If the knowledge portion of the test is satisfactory, conduct the skill portion.

### I. Conduct Skill Test.

- 1) Follow the objectives and tasks found in the TCO.
- 2) Evaluate the student's performance using the completion standards in the TCO.
- 3) Debrief the student on the quality of the demonstrated knowledge and skill stage test.
- 4) If the demonstration was satisfactory, make appropriate entries in the student records.
- 5) If the test was the final stage test for a certificate or rating issue a Temporary Airman Certificate.
- 6) If the demonstration was unsatisfactory, make the appropriate entry in the student records.
  - a) Inform the applicant of the failure, and explain how to correct.
  - b) Discuss the areas failed with the chief instructor, and recommend how improvement can be made.
  - c) If the test was a certification test, issue a Notice of Disapproval and place the application in the approved school's file at the GACA office.
  - d) If it is desirable to conduct the retest, advise the school.

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**J. Schedule Additional Stage Tests.** If an Inspector will conduct a retest, schedule the date and time.

**K. Close GAR.**

**4.8.5.15. TASK OUTCOMES.** Completion of this task results in either of the following:

- An entry in the student's record of a satisfactory stage test and issuance of a certificate or rating
- An entry in the student's record of an unsatisfactory stage test and denial of a certificate or rating

**4.8.5.17. FUTURE ACTIVITIES.**

**A.** Conduct additional stage tests as requested.

**B.** Conduct retests as necessary.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 9. PART 142 ADMINISTRATION**

##### **Section 1. Training Centers**

**4.9.1.1. PURPOSE.** This section contains guidance material to be used in the review and approval of training programs conducted under General Authority of Civil Aviation Regulations (GACAR) Part 142 training centers.

**4.9.1.3. BACKGROUND.** GACAR Part 142 provides the regulatory basis to enable certificated training centers to use approved curriculums, qualified instructors, and authorized evaluators to conduct the training, testing, and checking of airmen in qualified full flight simulators (FFS) and flight training devices (FTDs), which are collectively known as Flight Simulation Training Devices (FSTDs). In conjunction with GACAR Part 142, applicable sections of GACAR Part 61, 121, 125, 135, 133, 141 and 143 afford a means for crediting the training, testing, and checking accomplished in FSTDs toward the flight training requirements of those parts. The certification of Part 142 training centers also made additional resources available to operators (Part 121, 125, 135, and 133) to enable them to enter into agreements with a training center to conduct ground and flight training and checking for their crew members. With approval of the operator's principal operations inspector (POI), an operator may use a training center to conduct portions of the operator's approved training program. This provision has enabled certificated Part 142 training centers to provide a valuable service to operators who would otherwise not have the benefit of using FSTD to use in their crew member training curriculums.

**NOTE:** The term principal inspector (PI) will be used throughout this section to signify the Inspector with primary oversight responsibilities for the GACAR Part 142 training center. The PI of a GACAR Part 142 training center is synonymous with the FAA term training center program manager (TCPM).

**4.9.1.5. GENERAL.** Part 142 permits a certificated training center to use approved FSTDs and aircraft in conjunction with approved curriculums, qualified instructors, and evaluators to accomplish airman training, testing, and checking to meet the requirements of Part 61. GACAR Part 119 air operators conducting operations under Parts 121, 135 and aerial work operators who conduct their operations under Part 133 may, under certain conditions, permit training centers to conduct the required training and checking of their crew members. Conditions under which an operator may permit a training center

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to conduct required training, testing, and checking are outlined later in this section.

**4.9.1.7. DEFINITIONS AND TERMS.** All definitions of terms used in this chapter can be found in GACAR Part 1.

### **4.9.1.9 AUTHORIZED TRAINING FACILITIES—SATELLITES, FOREIGN CENTERS AND REMOTE SITES.**

**A. Satellites.** GACAR Part 142 provides that a training center may establish one or more satellites to provide some or all the services authorized for the certificated “principal” center. The approval process for satellite centers is the same as that of the principal center, except for required management positions, which may be shared with the principal. Consequently, the responsibility for operational control of satellite centers remains with the principal center. Contractual agreements for the use of FSTDs and classroom/briefing facilities are an essential requirement for selected satellites.

- 1) A satellite’s authority to provide training services is provided through the principal center’s Operations Specifications (OpSpecs). Removal of the satellite from the principal’s OpSpecs does not normally affect the principal center’s authority to operate. If the principal training center’s certificate is surrendered, suspended, revoked, or expires, the satellite center’s authority to operate is similarly affected.
- 2) Below are descriptions of the basic combinations of training centers and associated satellites:
  - a) Satellite of a Domestic Training Center. A Kingdom of Saudi Arabia (KSA)-based training center (principal center) holds the training center certificate, and its KSA-based satellite is listed in OpSpec A08. Surveillance of the satellite will be accomplished by the PI or an assistant designated by the PI.
  - b) Foreign Satellite of a KSA Domestic Training Center. A KSA-based principal holds a permanent training center certificate; however, the principal center’s PI is responsible for coordinating required surveillance of the foreign satellite. Adverse action and/or suspension of the KSA-based principal will affect the foreign satellite’s ability to continue operations. An adverse action against the foreign satellite could result in removal of the satellite from the principal’s OpSpecs, and may lead to compliance enforcement actions against the principal’s operating certification depending on the

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type and severity of the infraction.

**NOTE:** Foreign satellites of principal centers are not issued operating certificates or OpSpecs. However, the annual renewal requirements GACAR § 142.11 are applicable. PIs must ensure that each foreign satellite is included in their surveillance plan and shall remove any satellite from the principal's OpSpecs should the satellite fail to receive at a minimum an annual renewal evaluation or fail to maintain the requirements of Part 142.

c) Foreign Satellite of a Foreign Training Center. The satellite's foreign training center authority to operate is based on the principal's operating authority and OpSpecs. In this example, both the principal and satellite renewal dates will be the same. The foreign satellite's authority is typically renewed concurrently with the principal center's certificate renewal. The reissuance of the foreign satellite authority to operate is therefore dependent upon the outcome of the normal surveillance and oversight of both the satellite and the foreign principal center. The PI for the foreign training center will be assigned by GACA.

**NOTE:** If the certificate of a foreign principal training center expires or is not renewed, all of the principal center's satellite(s), regardless of their location, also expires.

**B. Foreign Training Centers.** Part 142 permits the certification of training centers outside the KSA. Other than the differences addressed below, training centers, and/or satellites located outside the KSA must meet the same regulatory requirements as those outlined for a domestic training center. The following identifies some of the operational and management differences between domestic and foreign training centers/satellites.

1) *Certificates.* Foreign training centers are issued a training center certificate valid for 12 calendar-months whereas a domestic training center's certificate is valid until the date endorsed on the certificate or the certificate is surrendered, suspended, or revoked.

2) *Surveillance and Investigation.* While the surveillance and oversight of domestic training centers and their associated satellites is typically conducted on a daily or weekly basis, the surveillance and oversight of foreign training centers and associated foreign satellites may be conducted on a less frequent basis. The reduced frequency is primarily associated with the difficulties associated with travel and in some instances country clearances. The reduced frequency, however, does not lessen the inspection detail; it merely changes the scheduling of required inspections to accommodate travel restrictions.

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3) *Foreign Center/Satellite Renewal.* The processes for renewal or recertification of a foreign training center include a review of all of the steps required for initial certification. However, a phased inspection process conducted throughout the year is considered more practical than one large annual inspection. While more frequent or day-to-day surveillance is preferred, a combination of inspections that will also meet renewal requirements may be used as a method of renewing the foreign-based training center's certificate. When warranted, a complete recertification evaluation should be conducted.

4) *Coordination.* Surveillance leading to investigation and/or enforcement action against a foreign training center certificated by the GACA will be handled through the normal enforcement processes. Inspectors are cautioned not to become involved with another country's pilot certification issues or the policies, procedures, and regulations of a foreign state. These events are to be coordinated with the host country's civil aviation authority. A fraudulent foreign airman certificate and or fraudulent training record entries are representative situations that must be coordinated with the host government authorities.

5) *Surveillance Responsibilities.* The GACA is responsible for the foreign center or satellite and has surveillance responsibility for the foreign operation. The PI of a domestic training center with a foreign satellite(s) will need to coordinate the surveillance responsible GACA official in regard to the oversight and surveillance of subject satellite(s).

**C. Remote Training Sites.** A remote training site is characterized by its temporary nature. It is distinguished by the fact that it uses facilities, such as simulators or classrooms, which are typically leased or not under the direct or full-time control of the certificated (principal) training center.

1) The management, staffing, instructors, Training Center Evaluators (TCE), training curriculums, and courseware at the remote site are provided by the principal training center and remain under the control of the principal center. Instructors and TCEs that have authority to provide instruction or evaluations at the principal center or satellite may also provide instruction and evaluations at a remote site providing they have been trained on the operation of associated flight training equipment.

**NOTE:** The PI must authorize remote training sites before the accomplishment of any training, testing, or checking is authorized by an amendment to the principal center's OpSpecs.

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### 4.9.1.11. TRAINING CENTER PI.

**A. PI Duties.** Training center PIs serve as the primary operations coordinator between the GACA and the training center. They oversee TCEs, ground/flight instructors, facilities, equipment, and curriculum approvals. The PI's role is to ensure that the training conducted by the center, its personnel, and facilities meets the regulatory standards of Part 142, and complies with established policy and procedures. PIs also coordinate with training center management regarding regulatory changes in GACA policy matters.

- 1) *PI Approval Responsibilities.* PIs are responsible for reviewing and granting approval of core and/or specialty curriculums that are submitted by the center. Once initially approved, each curriculum will be entered into the center's OpSpecs as either a core or a specialty curriculum.
- 2) *Assisting PIs.* PIs may be called upon to assist POIs of operators that are requesting to use the services of the PI's assigned training center. For those operators that may wish to use a training center's core or specialty curriculums to accomplish a portion of their training requirements, the training center PI may assist the operators POI with his evaluation of the center's capabilities to meet the operator's training requirements. If approved by the POI, the center's curriculums may become a part of that operator's training program.
- 3) *Surveillance of Training Centers.* PIs may function as a geographic resource for POIs whose operator(s) have been authorized to use the assigned training center or their satellites. Surveillance of this type is determined through mutual agreement between the PI and POI.
- 4) *PI Surveillance Responsibilities.* Refer to Section 5 of this chapter, for a discussion of the coordination activities associated with an operator outsourcing a portion of their crew member training to an authorized training center.
  - a) The PI must develop and conduct a surveillance program of all training center curriculums that are authorized in the center's OpSpecs.
  - b) Coordinate and conduct various surveillance and certification activities, as appropriate, with other Inspectors. This activity will primarily involve POIs for operators who have been approved to use the training center.

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- c) Determine through surveillance and investigation that the training center is adequately staffed with appropriately qualified instructors and TCEs.
- d) Monitor TCEs to determine adequacy and quality of approved training programs as well as the quality of checking and testing.
- e) Monitor instructors to determine adequacy and quality of approved training programs.
- f) Monitor flight training equipment status, including discrepancy logs as required by GACAR § 142.65 to assure continued compliance with qualification standards and authorized maneuvers.
- g) Monitor training programs conducted in support of the center's OpSpecs to ensure compliance with center procedures, GACAR regulations, policies, and procedures.

### 5) *PI Certification Responsibilities.*

- a) Conduct practical tests for the issuance of airman certificates and ratings.
- b) Conduct or observe the reexamination of certificated airmen following failures to meet the minimum standards required for the certificate they hold.
- c) Initiate and/or assist in the emergency airman certificate actions.
- d) Conduct enforcement investigations and prepare reports in those cases requiring legal disposition.
- e) Review, recommend necessary changes to, and approve OpSpecs, training center curriculums, courseware, and associated revisions.
- f) Recommend amendments to previously approved programs to eliminate unsafe practices, and/or improve the efficiency of the curriculums.
- g) Conduct formal inspections on a regular basis and evaluate methods and plans for any necessary corrective actions, including follow-up inspections to ensure that appropriate corrective action has been taken.

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h) Approve individual maneuvers and functions in support of the center's curriculums for FSTDs that have been appropriately qualified by a recognized approval authority.

i) Conduct periodic record evaluations to determine the center's compliance with the GACAR, center policies, and other regulatory requirements.

### 6) *Approval and Oversight of TCEs.*

a) Train and examine TCEs for initial designation, recertification, and standardization as an evaluator as necessary.

b) Approve TCEs for specific types of aircraft and simulators operated by the training center and enter appropriate authorizations in the center's OpSpec.

c) Monitor TCEs during the conduct of airman certification and recurring evaluations to ensure compliance with established standards and approved procedures and TCE authorization letters.

### 7) *PI FSTD Surveillance Responsibilities.*

a) Review applications for initial or upgrade evaluation of FSTDs.

b) Periodically conduct practical evaluations of FSTDs to determine that they continue to meet the initial approval performance standards.

c) Review and approve simulator inoperative component guides.

d) Review simulator discrepancy logs for deficiencies that have not been corrected in a timely manner and that may affect the capabilities of the flight training equipment to meet training curriculum requirements.

e) Verify through actual flights or operation of training devices that each maneuver, procedure, crew member function, circling approach, and runway scene required to support a proposed curriculum can be accomplished in accordance with the device's qualification.

f) Monitor the center's notification of any discrepancies and or modifications that may

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require reevaluation by the approving authority.

8) *Technical Oversight.* The PI must maintain technical oversight of assistant PI's assigned for support duties to the PI's training center whose duties include responsibility for one or more specific aircraft training programs conducted by a training center.

9) *Assistant PI Duties.* Assistant PI duties include the following:

- a) Conduct surveillance and assist the PI with assigned responsibilities on an as required basis.
- b) Additional duties as assigned by the PI or PI's supervisor.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 9. PART 142 ADMINISTRATION**

##### **Section 2. Training, Qualification and Designation of Training Center Instructors and Evaluators for Part 142**

###### **4.9.2.1. GENERAL.**

**A. Requirements.** General Authority of Civil Aviation Regulation (GACAR) Part 142 requires each training center to have adequately trained personnel to accomplish the center's approved training curriculums. GACAR Part 142, Subpart C outlines the qualifications, prerequisites, training requirements, and limitations of training center instructors and evaluators who are employed by training centers to conduct instruction and evaluations on their behalf.

**B. Instructor and Evaluator Qualifications.** Part 142 requires that each approved curriculum specify minimum instructor and evaluator qualifications and the initial and continuing training required by those individuals to conduct the assigned curriculums. The qualifications and training required to ensure center instructors and evaluators are competent to conduct the assigned training curriculums is an integral part of a center's approved program. Principal inspectors (PI) must ensure that the center has developed and received approval for their instructor and evaluator training curriculums. The various curriculums and syllabuses must identify, in a modular format (including specific elements and events), the specifics of each required course of training for their instructors and evaluators.

**NOTE:** The term principal inspector (PI) will be used throughout this section to signify the Inspector with primary oversight responsibility for a Part 142 training center.

**4.9.2.3. INSTRUCTOR TRAINING, QUALIFICATION, AND DESIGNATION.** Although Part 142 does not specifically address the differences or distinguish between ground and flight instructors, it is a well-established practice to make this distinction. The distinction between ground and flight instructors at training centers is appropriate for a number of reasons. First, it enables the centers to distinguish between medical and pilot certification requirements as well as the training required to qualify an individual to conduct a specific portion of an approved curriculum. Additionally, it affords the centers the flexibility currently provided to operators by their operating rules and policies governing ground and flight instructors.

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### A. Ground Instructors.

- 1) A training center ground instructor is an “authorized instructor” similar to the holder of a ground instructor certificate issued in accordance with GACAR Part 61. Training center ground instructors, when properly qualified, may provide instruction in the ground-training segment of a center’s core and/or specialty curriculums. Individuals that a center wishes to designate as a ground instructor may only be authorized to conduct training that is not considered flight training. Training centers must have an approved process to train and qualify ground instructors, ensuring those individuals are knowledgeable in the subject matter and qualified to conduct assigned curriculums. Part 142, Subpart C requires that training centers identify the training, experience, and evaluations that will be administered to perspective instructors prior to permitting the individual to conduct an approved curriculum. A current list of training center ground instructors must be maintained by the training center and approved by the PI.
- 2) Occasionally, training centers may employ subject matter experts (SMEs) to support specific curriculum elements that demand specialized technical training and experience that would not otherwise be available. For example, it may be appropriate to use emergency medical service personnel to conduct cardiopulmonary resuscitation (CPR) training or request that the aerodrome fire and rescue personnel assist to discuss aircraft crash and rescue procedures. SMEs, such as engine and equipment manufacturers, may also be used to assist regular training center ground instructors in a particular subject area to provide additional information and experience to enhance the course content.
- 3) As required by GACAR § 142.55, all instructors must be able to read, write, understand, and speak English. Fluency in reading, comprehension, and especially speaking are critical attributes for all instructors. Ground school instructors who conduct systems integration sessions in flight training devices (FTD) must also receive training in the applicable portions of the center’s flight training segment to ensure an adequate level of knowledge and skill are obtained to support the assigned curriculum. Training centers must also develop training curriculums to qualify ground instructors in the use of all hardware, software, and training devices (both ground and flight) that are identified in the curriculum modules/elements that the instructor will be assigned to conduct. These training curriculums must contain both knowledge and skill demonstration testing modules. The instructor’s training record must contain a record showing the satisfactory completion of these tests. Both initial and recurrent training and testing records must be maintained in the

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instructor's file. If the instructor is assigned to deliver modules/elements that incorporate a FFS or an FTD for system review, the instructor must also demonstrate their proficiency in the use of the supporting FSTD(s). Again, ground instructors, if authorized, are limited to non-flight activities.

4) Each instructor designated as a ground instructor must complete the applicable training and testing requirements specified in Part 142, Subpart C not specifically related to flight duties.

### **B. Flight Instructors (FSTD).**

1) GACAR §§ 142.55 and 142.57 outline the instructors' eligibility, airman qualifications, and experience requirements that each center must address in its instructor training curriculums. A center's instructor training curriculum must describe in detail how the training center will train its flight instructors in the areas required by GACAR Part 142 and the center's policies and procedures.

2) The training center must have an approved curriculum, including syllabus and courseware, to train flight instructors to ensure that instructors are knowledgeable and proficient in the subject matter, maneuvers, and procedures the instructor will be assigned to conduct. This curriculum must include:

- Training in the operation of the associated hardware, software, and flight training equipment that will be used
- Required prior experience, training to be received, and evaluations that will be accomplished as part of the instructor's qualification
- Recurrent ground training in basic instructional methods, operation of FSTDs as well as instruction in the specific content of each training course in which the instructor is designated to instruct

3) When evaluating a center's instructor training curriculum, PIs must ensure that the items specified in GACAR § 142.55(c)(1) and (2) have been adequately covered. The following guidance is provided to clarify the intent and scope of the items listed in GACAR § 142.55(c)(1).

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- a) Principles of learning, including instructional methods and techniques.
  - b) Training center policies and procedures. Forms and distribution, briefings/debriefings, unsatisfactory performance, crew pairing limitations, maximum training day length, checklist usage, and customer read files, etc.
  - c) Instructor duties, privileges, responsibilities, and limitations. Customer contact, scheduling, applicable regulations/orders/notices/advisory circulars (AC), authorized exemptions, etc.
  - d) Proper operation of the FSTD, including controls and limitations, the use of simulator discrepancy logs, simulator component inoperative guides.
  - e) Customer requirements and applicable differences training, etc.
  - f) Minimum equipment requirements for each curriculum. Operation of audiovisual systems, who to contact for inoperative equipment, acceptable alternate presentation methods, etc.
  - g) Crew resource management and crew coordination.
  - h) Evaluation of student performance. Center policy on reporting, customer policy on reporting, corrective action in the event of substandard performance, etc.
  - i) Content and revisions to each training curriculum. How to request amendments, amendment process, how to validate the currency of center/customer material, etc.
- 4) Each flight instructor must satisfactorily complete a written test on the subject areas outlined in GACAR § 142.55(c)(1). The test must be approved by the PI and be comprised of questions that are equivalent in difficulty, complexity, and scope to those specified by the GACA for the Flight Instructor Airplane, and the Instrument Flight Instructor knowledge tests.
- 5) Flight instructors are required, prior to initial designation and annually thereafter, to demonstrate to an inspector or evaluator the knowledge of and proficiency to instruct in a representative segment of each curriculum for which that instructor is designated to instruct at the center. The demonstration of instructing ability must be performed from the instructor

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panel in a FSTD (as applicable), representing each type of aircraft in which the individual will instruct. In addition, if authorized to instruct in an aircraft due to the limitations of the FSTD, not permitting 100 percent training, testing, and checking, the flight instructor must accomplish an annual proficiency check in the aircraft on at least the maneuvers that are not authorized to be accomplished in the FSTD.

**C. Flight Instructors (Aircraft).** A flight instructor who provides instruction in an aircraft in those maneuvers and procedures unable to be accomplished in an approved FSTD must meet the same qualifications and training/evaluation requirements that are specified for a FSTD instructor plus the additional training requirements stated in GACAR § 142.59(a)(5) and (6). In addition, if instruction is given in an aircraft from a required crew member position, each instructor must hold a medical certificate, a current GACA flight instructor certificate with appropriate category, class, and type rating and must maintain recency of flight experience as required by GACAR § 61.17. If instruction is provided from a non-crew member position or observer seat, the pilot in command (PIC) must be qualified and current as a flight instructor in the aircraft.

**NOTE:** Flight simulator instructors and evaluators who instruct, or evaluate in an aircraft may maintain recency of flight experience in a flight simulator, as authorized by GACAR § 142.77.

### D. Designation of Instructors.

1) The training center must authorize and designate each ground and flight instructor in writing who is qualified to provide instruction on behalf of the center. Authorization letters or records must include the:

- Instructor's name
- Employee identification
- Initial qualification date for each authorized curriculum
- Curriculum/module/element name and course number (if appropriate)
- Other qualifying information the GACA deems appropriate

2) The operations specifications (OpSpecs) issued to each training center require that the

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center maintain a list of qualified instructors. This listing must also identify the curriculum(s) that the instructor is authorized to conduct on behalf of the training center. The PI should advise the training center that all changes or additions to this list will require notification to the PI within 5 working-days.

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**CHAPTER 9. PART 142 ADMINISTRATION**

**Section 3. Reserved**

**NOTE:** This guidance to be developed at a later date.

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**VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

**CHAPTER 9. PART 142 ADMINISTRATION**

**Section 4. Reserved**

**NOTE:** This guidance to be developed at a later date.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 9. PART 142 ADMINISTRATION**

##### **Section 5. Outsource Training - Contracting With Training Providers for Part 142**

**4.9.5.1. GENERAL.** This section provides policy guidance for General Authority of Civil Aviation (GACA) principal operations inspectors (POIs) that receive requests from their operators to outsource a portion of their required training. The information in this section is relevant for both the training center PI and the individual POI for an operator, depending on the type of training being outsourced to the training center. As a general rule, this section is written for the use of POIs, however it should also be used by other aviation safety inspectors (Inspectors) who may need to review and approve certain specialized training that is outsourced to a training center.

**NOTE:** The term principal inspector (PI) will be used throughout this section to signify the Inspector with primary oversight responsibility for a Part 142 training center.

##### **4.9.5.3. BACKGROUND.**

**A. References.** In addition to General Authority of Civil Aviation Regulations (GACAR) Part 142, applicable sections of GACAR Parts 61, 121, 125, 133, 135, and 141 provide a means for crediting the training, testing, and checking accomplished in full flight simulators (FFS) and flight training devices (FTD) toward the flight training requirements of those parts. GACAR Part 142 has made the use of training centers by operators more widely accepted as an “alternative means” of providing training to its employees.

**NOTE:** “Alternative means” permits an operator to outsource or arrange to have its approved training conducted by a third party. It does not mean that an operator has an “alternative means” to meet the training approval requirements governing its particular operation. Programs approved in accordance with GACAR Part 142 may not be used as an alternative means of satisfying the requirements of the appropriate operating rules as approved by the operator’s POI.

**B. POI Coordination.** When an operator wishes to use the services of a Part 142 training center, the most common operational issues the operator’s POIs must resolve are outlined below:

- 1) Exactly what portion of the operator’s required crew member training; checking, and/or

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testing will the training center be authorized to conduct?

- 2) What qualification requirements are necessary to enable training center flight instructors to conduct the requested training?
- 3) How does the operator propose to qualify Training Center Evaluators (TCEs) or other personnel to become contract check pilot? (Refer to Volume 14, Chapter 10, Section 1, Evaluate a Training Center Evaluator)
- 4) What documentation is required to ensure the training conducted by the center complies with the operator's approved curriculums, and how does the operator propose to document this training?

### **4.9.5.5. BASIC STRUCTURE.**

**A. Operating Rules.** GACAR Part 61, 121, 125, 133, 135, 141 and 143 permit those operators to use the services of another operator certificated under the same part or a certificated GACAR Part 142 training center to conduct some or all of their required training. If approved by the operator's POI, the operator may use the training provider's facilities, equipment, and personnel to varying degrees to accomplish the training, checking, and testing required by their approved training program.

**B. Training Curriculum.** Regardless of who actually developed an operator's training curriculum, the operator is responsible for its approval, oversight, content, and currency. Regulations are very clear regarding an operator's requirement to have appropriate training programs that support their particular operation. The regulations are also clear concerning the requirement to have these programs approved by the operator's POI. In similar fashion, training centers certificated under GACAR Part 142 are also required to have their curriculums approved by the training center's PI.

### **4.9.5.7. PART 142 APPROVED CURRICULUMS.** A short review of the various types of training center curriculums and their approval process will assist with our understanding of the appropriateness of these curriculums for use by an operator. It is important to emphasize that a center's approved curriculum may not be used by an operator without first being evaluated for appropriateness and secondly, being approved for use by the operator's POI.

#### **A. Core Curriculum.**

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- 1) A core curriculum is a training center-developed course that is approved by the PI for the purpose of meeting the training and certification requirements of airman.
- 2) In order for a training course to be approved as a core curriculum it must:
  - a) Meet the applicable requirements of GACAR Part 142, Subpart B and the individual certification part as appropriate to the crew position being trained.
  - b) Contain all the events and maneuvers required by the appropriate practical test standards for the issuance of the particular airman certificate for which the curriculum was designed.
  - c) Consist of training segments that identify training and testing requirements for the issuance of a particular certificate.
  - d) Include maneuver descriptions, standard operating procedures, checklists, and other supporting courseware.
- 3) Part 142 pilot training curriculums are designed to meet the certification requirements of GACAR Part 61 and therefore do not include many of the operator-specific elements required by the operating rules associated with an air operator. For example, a GACAR Part 142 core curriculum does not require a training center to specify the training that is normally found in an operator's Operations Specifications (OpSpecs), such as authorized takeoff or landing minimums, types of authorized approaches, and captain high minimum requirements. Additionally, ground training in areas such as dangerous goods, security, aircraft maintenance, logbook procedures and flight following is also not required to be part of a GACAR Part 142 training center's core curriculum. Although a training center's Part 142 approved core curriculum may meet the aircraft specific requirements for an operator, these curriculums do not qualify operator's pilots for line operations and may not be used by an operator without the specific approval of the operator's POI.

**B. Specialty Curriculums.** This term refers to courses that are designed to satisfy a particular requirement of GACAR, other than airman certification. The PI is authorized to approve specialty curriculums for use by a training center and, if appropriate, associated satellite and/or remote sites. Training centers often develop specialty curriculums to meet the specific needs of a particular customer. Some examples of specialty curriculums include (but are not limited to)

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Category II/III authorization, equipment differences training, night vision imaging systems (NVIS) and so forth. Specialty curriculums can vary widely in focus and subject matter and may be developed for personnel other than flight crew members. The approval of specialty curriculums or courses by the PI, however, does not enable those curriculums or course to be used by an operator without the specific approval of the operator's POI.

**4.9.5.9. ROLES, RESPONSIBILITIES, AND COORDINATION.** The safety, efficiency, and quality of training provided by training centers, through the use of structured programs and advanced simulation devices, has proven to be an effective and economical means for some operators to accomplish required training. Consequently, a number of operators have come to rely on Part 142 training centers as a source of technical expertise and as their primary training provider. As the use of approved training centers continues to expand, it becomes increasingly important to understand the roles, responsibilities, and coordination activities required of each participant. The following discussion presumes that the activities discussed are being conducted in accordance with the associated regulations and any related guidance material published by the General Authority of Civil Aviation (GACA).

**A. Operators.** The regulatory responsibility for ensuring that an operator's training program remains current and continues to meet the operator's needs resides with the operator, not the training provider. When an operator makes application to use the services of an authorized training provider they must:

- 1) Ensure that all training, testing, and/or checking to be conducted by the training center has been approved by the POI before any training is accomplished.
- 2) Develop an instructor/check pilot standardization program including a checklist, which clearly identifies those elements of the operator's program that are to be completed by the training center and those that are to be completed by the operator. This checklist must specifically identify each training element that will be conducted by the center and include the regulatory and/or the training program reference for each item.
- 3) Develop an implementation plan to perform oversight of center facilities and personnel engaged in the conduct of the operator's training and associated evaluations. The operator's implementation plan must:
  - a) Ensure that all training center personnel selected to act as contract instructors (both ground and flight) and/or contract check pilot are appropriately trained and qualified.

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- b) Provide the center with appropriate administration procedures and instructions to be used in the accomplishment of agreed training.
  - c) Provide for the oversight of all contract center personnel who are authorized to conduct training, testing, and/or checking on behalf of the operator.
- 4) Additionally, the following procedures must be followed when requesting the use of center personnel to become qualified as contract check pilot:
- a) Evaluate the instructor's/TCE's credentials to ensure he meets company requirements to become a contract check pilot.
  - b) Evaluate the individual's training record to determine the differences training required to qualify the individual as a contract check pilot.
  - c) Develop an appropriate training differences module(s) to qualify the center's instructor/TCE as a contract check pilot and submit the training module to the POI for acceptance/approval.
  - d) Conduct and record appropriate check pilot training; submit the individual's name, short resume, and training records to the POI for review and approval.

**NOTE:** POIs should notify the center's PI whenever they authorize one of the center's personnel to act as a contract check pilot by forwarding the PI a copy of the contract check pilot's letter of authorization (LOA).

- 5) Coordinate the approval of missing Flight Simulation Training Device (FSTD) or Malfunctioning and Inoperative (MMI) equipment or procedures that will be used in support of the operator's curriculum.

### B. Operator POIs.

- 1) When an operator requests the use of a training center's facilities, training devices, curriculums (core and/or specialty), flight instructors, TCEs, and/or other services, including recordkeeping, the POI is responsible for determining the operator's request conforms to the appropriate regulations, policies, and procedures.

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2) The approval authority for an operator to conduct training at a training center resides with the operator's POI. If an operator wishes to use a training center's core and/or specialty curriculums to meet a portion of their required training program, it is the operators' responsibility to ensure:

- a) The center's curriculums /courses meet the operator's training requirements.
- b) The curriculums are submitted to the operator's POI for review and approval.
- c) The curriculums are integrated into the operators training program.

**NOTE:** If the curriculums are approved for the operator's use, these curriculums now become a portion of the operator's approved training program, and the maintenance/currency of those curriculums becomes the responsibility of the operator, not the training center.

3) If an operator applies to have the same training curriculum conducted by two or more centers (either operated by the same or a different training provider/company), the operator must develop an implementation plan for each center and ensure that each of the approved centers conducts their training curriculum using the operator's approved training curriculum (including maneuvers, procedures, and checklists). Additionally, each center must be specifically approved for use by the POI and listed in the operator's OpSpec A31. It is the responsibility of the operator to ensure that all required software and hardware approved to support the subject curriculum is available and used by each center during the delivery of their training curriculum.

**NOTE:** POIs should notify the training center's PI whenever they authorize one of the center's personnel to act as a contract check pilot. This may be accomplished by forwarding the PI a copy of the contract check pilot's Letter of Approval (LOA). POIs are encouraged to contact the training center's PI for assistance with the review and potential approval of a contract check pilot. PIs are often the best source of information relating to a center's operation and personnel for an operators POI.

4) When an operator requests approval of a training provider's personnel, to act as contract instructor and/or contract check pilot to conduct a portion of their required training, it is the operator's responsibility to ensure those individuals are qualified to conduct the subject training. Prior to authorizing a center's flight instructors or TCE(s) to conduct any portion of an operator's training, the operator must qualify each individual in accordance

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with the training and testing requirements of their operating rule and provide sufficient evidence of such training and checking to the POI for review and approval.

5) The GACAR require an observation of each authorized flight instructor, simulator and aircraft check pilot to be accomplished at least once every 24 months.

**NOTE:** GACAR Part 142 has similar requirements for flight instructors and evaluators. However, GACAR Part 142 requires these observations to be conducted at least once every 12 months (See GACAR §§ 142.59(a)(1) and 142.61(a)(2)).

a) The intent of these regulations is to ensure the continued standardization and quality of each operator's training program by performing periodic observations of each flight instructor and check pilot by focusing on the individual's performance in conducting a representative part of a curriculum or training program approved for that operator.

b) A qualified Inspector may be requested to observe contract flight instructors and contract check pilot on behalf of the POI. Whether conducting its own training or contracting for training with a training provider, each operator must ensure that all required observations are accomplished and documented. A training center's Part 142 observations of their flight instructors may meet the requirements for the center under GACAR Part 142, but do not meet the requirements for an operator under GACAR Part 121 or Part 135. Such an observation might be acceptable for a portion of an operator's requirement under the following conditions:

1. When the training curriculum or curriculum segment conducted by the training center is essentially the same as that of the operator.

2. When the observation is acceptable to the operator's POI.

c) An observation conducted by an Inspector is always permissible instead of an observation conducted by an approved check pilot or by a designated examiner employed by the operator. An observation by an Inspector counts toward the observation requirements of all operators contracting for training program services provided by a training center. PIs and operator POIs may conduct an observation at any time at their discretion. It is anticipated that operators and training centers will exchange information regarding observations of their instructors. However, it is the

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responsibility of the operator to ensure that all required observations are kept current and are documented.

- 6) Conduct training center surveillance to determine continued compliance with the operator's approved program.
- 7) If the operator requests approval of two or more centers, determine that all training, testing, and checking is conducted using the operator's approved curriculum. To ensure standardized training for all of the operator's crew members, it is essential that, before authorizing multiple sources of training, the operator provides the POI with a surveillance plan to ensure continued compliance with their approved curriculum by all centers. Each authorized training center must conduct the operator's curriculum as approved by the operator's POI and be alike in content, training times, maneuvers descriptions, procedures, checklists, and training devices. Crewmember training using differing curriculums for the same aircraft is not acceptable.
- 8) Determine that FSTDs are appropriate to, and representative of, the aircraft being operated by the operator. Flight training equipment must be specifically qualified and approved for the operator's use, as well as each maneuver, procedure, or crew member function to be trained.
- 9) Each training facility must be authorized and listed in the operator's OpSpec A31.
- 10) Each training curriculum/module approved to be conducted by a training provider must be listed, by curriculum title, in the operator's OpSpec A31.
- 11) Review the operator's instructor/check pilot standardization program.
- 12) Review the operator's training center audit program.
- 13) Ensure that required airman training records meet regulatory requirements. If requested by the operator the POI may permit the training provider to maintain the operator's crew member training records. Permitting a training center to maintain operators' records does not relieve the POI of required check pilot/aircrew program designee (APD) tracking requirements.

**C. Training Center PIs.** From time to time, training center PIs may be called upon to assist a POI

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whose operator is using the services of a training center. The PIs firsthand knowledge of center personnel, facilities, equipment, and curriculums is a valuable resource that POIs have come to rely on. This knowledge enables POIs to:

- 1) Provide the operators POI information regarding the status and approval level of FSTDs, and the installed equipment used by center instructors and TCEs.
  - 2) Assist the operators POI by providing technical information regarding the center's curriculums, training devices, and facilities.
- NOTE:** Training center PIs should advise the operator POI of any status change involving an instructor or TCE that is also approved as a contract check pilot for an operator.
- 3) Assist the operator POI with the evaluation of TCEs or other training center personnel nominated by the operator to become contract check pilot or flight instructors.

**D. Training Center.** A training center's roles, responsibilities, and coordination activities include:

- 1) Participating in the operator's instructor/check pilot standardization program to ensure there is a clear understanding between the center and the operator of exactly what portions (by regulation) of the operator's approved curriculums the center will be conducting.
- 2) Ensuring the operator has received approval from their POI to use center facilities and personnel in the conduct of their approved curriculums.
- 3) Ensuring that all center personnel used to instruct and/or check on behalf of the operator have been appropriately trained, evaluated, and authorized in accordance with the operator's approved curriculums to conduct such activities. This training must include, at a minimum, training in all portions of the operator's curriculums for which the contract instructors/check pilot are assigned to conduct on behalf of the operator.
- 4) Ensuring that sufficient contract instructors are qualified to support the operator's training agreement and requirements.
- 5) Recommending (not qualifying) center personnel as potential contract check pilot. The center must ensure recommended individuals:

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- a) Have completed the center's approved instructor training program.
  - b) Are currently qualified and actively participating in one or more of the center's core curriculums appropriate to the operator's needs.
- 6) Maintaining the center's FSTDs in accordance with their qualification standards.
- 7) Advising the operator whenever flight training equipment fails to meet required qualification standards and/or when maintenance problems will restrict training.
- 8) Ensuring required training records are appropriately maintained and remain readily available to both the operator's POI and the operator.
- 9) Ensuring crew pairing policies and procedures are adhered to as it relates to the operator's training and testing/checking.
- 10) Advising operators of any proposed revisions to the center's curriculums that are being used partially or in total by the operator.

### **4.9.5.11. OUTSOURCED TRAINING PROVIDER APPROVAL PROCESS.**

#### **A. Application to Outsource Required Crew Member Training.**

1) Operators requesting approval to outsource a portion of their required flight crew member training must submit an application in a form and manner prescribed by the operators POI. The application must contain sufficient detail to enable the POI to evaluate the applicant's request. Applications should be submitted at least 60 days prior to the proposed training and contain at least the following information:

- a) A copy of the initial training center audit including an analysis of the training provider's curriculums, courseware, procedures, equipment, facilities, and personnel that will be used in the conduct of the operator's training.
- b) A detailed outline, by regulatory reference, of the training elements proposed to be outsourced.
- c) If training center personnel will be used as contract instructors to conduct the

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operator's training the application must contain an appropriate training module developed to qualify centers instructors/TCEs on the operator's curriculum.

- d) If training center personnel are being requested to act as contract check pilot the application should contain an appropriate training module developed to qualify centers instructors/TCEs as contract check pilot for the operator.
  - e) A copy of the operator's instructor/check pilot standardization program.
  - f) A copy of the operator's proposed surveillance plan to ensure the center continues to provide the agreed training.
  - g) Proposed method to maintain required crew member, contract instructors, and contract check pilot training records including the methodology proposed to ensure curriculum revisions and an appropriate instructor/check pilot read file are maintained.
  - h) Any other data the POI may need or find necessary in order to evaluate the application.
- 2) The approval for an operator to use a GACAR Part 142 training center or other provider in the conduct of their required training is authorized through the issuance of OpSpec A31. An initial standardization review must be conducted by the operator and submitted to the POI before any contract training or checking may be conducted. OpSpec A31 also requires the operator to conduct ongoing audits of the training center/provider to ensure the training center is continuing to provide training and checking in accordance with the operator's approved program. The initial audit should be completed within 60 days of the commencement of contract training or checking operations. Each audit with evaluation must be presented to the operator's POI for review and acceptance within 30 days after completion. Ongoing audits will be conducted at least every 24 months in order for the operator to continue to use the training center/provider.

### **B. Flight Training Equipment.**

- 1) In order to receive training/checking/testing credit for the use of a FSTD, the specific device must be a part of the operator's approved curriculum. The subject curriculum and training device are a part of the outsourced training audit and must include a comparison of the aircraft flown by the operator to the flight training equipment available at the training

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center. The comparison should encompass the make, model, and series (M/M/S) (and serial number, in some cases) of the aircraft and simulator and include a summary of the flight instrumentation, autopilot, flight management system (FMS) equipment, aircraft modifications (electrical system, hydraulic system, engines, propellers, thrust rev, heads-up display, etc.) applicable to each. Regulations require that the flight training equipment fully meet the requirements of the operator's training program and accurately represent the M/M/S of aircraft flown by the operator including installed equipment. If the flight training equipment available at the training center does not match the operator's aircraft, the operator's program must state how any differences between the aircraft and the FSTDs will be addressed and develop an appropriate differences training module.

- 2) A PI's approval of a training center's FSTD for use within the center's approved curriculum does not authorize an operator to use the same devices within the operator's curriculum. The PI's approval only ensures that the training devices are approved to conduct the training, testing, and checking permitted under GACAR Part 142. In order for an operator to use a center's training devices in support of the operator's curriculum, the operator must include the devices in its training program and have the devices approved by its POI. The operator's POI will evaluate the requirements of the operator's program and make a determination concerning the appropriateness of the center's training devices and their qualification as it relates to the operator's curriculum. POIs may request verification of the flight training equipment authorized for use by a training center by contacting the training center's PI.
- 3) To receive training credit for a particular FSTD, the device must first be qualified by an appropriate qualifying authority accepted by GACA. The authority responsible to qualify the device will assign a specific level of qualification. PIs and operator POIs may then approve the device for use by a center or operator respectively, by specific maneuver(s), procedure(s), and crew member function(s). Approval letters are generally issued to operators and centers specifying the device's use within a specific curriculum. Operators are authorized the use of training devices through the inclusion of the device in their training program.

**NOTE:** An applicant for, or holder of, a training center certificate must ensure that each aircraft used for flight instruction and solo flights meets the requirements of GACAR § 142.63.

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### C. Approving/Accepting a Center's Core or Specialty Curriculums for Use by an Operator .

- 1) Training centers often submit programs to their PI for approval that are targeted for specific customers and/or operators. However, these curriculums must meet GACAR Part 142 requirements and are either “core” or “specialty” as defined by GACAR Part 1. Once a curriculum is approved by the PI, it is listed in the center’s OpSpecs as a core or a specialty curriculum/course. For an operator to use a center-developed curriculum it must submit the curriculum to its POI for approval. The procedure for approving a center-developed curriculum is the same as if the operator had developed the curriculum or paid a consultant to develop the curriculum. The important point to remember is that when the subject curriculum/course is approved by the operator’s POI, it becomes part of the operator’s training program and as it relates to the operator, it ceases to be either a core or a specialty curriculum.
- 2) Once the subject curriculum/course is approved by the operator’s POI, the center, when conducting training for the operator, should refer to the subject curriculum by the name given to it by the operator. It is important to note that the training center should not refer to the operator’s program as a specialty curriculum. This naming convention is important to clarify oversight and ownership responsibilities for the subject curriculum/course. An operator’s programs are approved by its POI in accordance with the appropriate operating rule.
  - a) Training center curriculums, both core and specialty, are approved by a training center PI in accordance with GACAR Part 142 and designed to meet the training, testing, and checking requirements of airmen certification.
  - b) The flight crew member requirements of the applicable GACAR parts differ in numerous respects to GACAR Part 61 requirements. A PI’s approval of a center’s curriculum does not enable an operator to use such curriculum without the specific approval of the operator’s POI.
- 3) In order for an operator to request a training center’s approved curriculum to be incorporated into their program, the operator must first complete a comparison between the proposed center’s curriculum to their approved curriculum. All differences must be noted and a training module developed to bridge the differences. This training module will be used to qualify the center’s instructors and/or TCEs on the operator’s curriculum. It is the

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operator's responsibility to ensure all center instructors and/or proposed contract check pilot receive training on the differences module(s) developed as a result of the curriculum comparison before they may be authorized as contract instructors or contract check pilot for the operator.

4) The operator may find that a center's curriculum may be used without change but that there may be minor differences in operating procedures and/or checklists. As part of the standardization and audit process, the operator must determine all differences between their curriculum and the center's. If the differences found are minor, the operator's POI may authorize the operator to develop a briefing guide outlining the differences as a suitable method to provide the training necessary to qualify the center's personnel. Major differences between the curriculums will require specialized differences or formal retraining of the center's personnel. In all cases, the operator's regulations require contract instructors and check pilot to be trained in the approved methods, procedures, and limitations for performing required normal, abnormal, and emergency procedures appropriate to the curriculum segment.

5) Operators must have training policies and procedures in their operations manuals or training program that describe their standard operating procedures and type of operation(s). At a minimum, operators that apply to contract a portion of their required crew member training to an authorized provider must have policies and procedures in place that clearly identify the following:

a) Standard operating procedures, including but not limited to:

- Crew coordination and “call-outs”
- Maneuvers descriptions and aircraft configuration
- Cockpit “flows”
- Checklist procedures
- Autopilot use and crew coordination
- Crew resource management

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- Approach procedures (including approach charts, crew briefing etc.).
- 6) POIs and operators must be aware that center-approved curriculums are designed to meet the certification requirements and the associated practical test standards. Consequently, GACAR Part 142 training center curriculums will not comply with the operating rules governing an operator and by default nor do they contain operator-specific requirements or the limitations/authorizations contained within an operator's OpSpecs.
- 7) If an operator is introducing a new aircraft and requesting the adoption of a center's curriculum in support of the introduction, the operator is responsible for ensuring the proposed curriculum meets their operational requirements. Additionally the operator must:
- a) Evaluate the proposed curriculum and submit it to their POI for approval/acceptance.
  - b) Develop a module(s) outlining any operator-specific training required to qualify center personnel as contract instructors and or contract check pilot based on the POI's authorized curriculum.
  - c) If a contract check pilot is being proposed, the operator must provide the selected individual with any operator specific training identified during the curriculum approval process.
  - d) Submit an appropriate contract check pilot request to their POI at least 15 working-days prior to the proposed use of the contract check pilot.
- 8) Table 4.9.5.1, Sample—Mass and Balance Curriculum Module Comparison Chart, provides an illustration of the differences that normally occur when an operator completes a comparison and evaluation of a mass and balance training module that was designed for a GACAR Part 142 training center against one designed for an operator. The table also illustrates the complexities typically encountered by an operator when conducting a curriculum comparison between their approved training program and that of a training center.
- 9) Column A in Table 4.9.5.1 lists the elements normally associated with an approved GACAR Part 142 mass and balance training module. Column B represents a typical Part 135 mass and balance training module. Because GACAR Part 142 is typically modeled after the manufacturer's procedures certain differences between the operating rules and the aircraft

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manufacturer procedures will arise. When confronted with these differences, an operator must decide to either:

- a) Train and qualify the center's instructors to enable them to conduct the operators approved mass and balance training module; *or*
  - b) Providing there is no negative training involved, permit the center to conduct the manufacturer's mass, balance training, and then conduct a specialized course designed to cover the differences between the center's curriculum and that of the operator. If the operator chooses to permit the center to conduct the center's mass and balance module, the operator would then be required to convene an instructional period to train and test the differences between the center's curriculum and the operator's mass and balance curriculum. Differences training would be required prior to releasing any crew member for line operations.
  - c) The operator could elect to provide mass and balance training to one of the center's instructors in those elements of their curriculum that are different from the center's curriculum. It would then be possible for the qualified instructor to conduct the entire mass and balance module for the operator's crew members. However, without specified training in the operator's procedures, the center may only be authorized to provide training and testing in those subjects that are part of the center's curriculum (Table 4.9.5.1, lines 1 through 4). In either case, operators must develop a quality control program that will ensure their curriculum is conducted in accordance with their approved procedures and conducted by qualified individuals.
- 10) The curriculum an operator submits for approval to its POI must contain sufficient detail to assure all required training is addressed. The operator is responsible for submitting the subject curriculum to its POI for review, approval/acceptance, and subsequent inclusion in its training program, before any training is accomplished by the training provider.
- 11) This document will be jointly developed by the training provider and the operator, and will specify the division of all tasks required for training/testing/checking between the training provider and the operator. (Other equivalent methods that specify the division of tasks may be acceptable.) The operator bears the primary responsibility to ensure that all ground and flight training required by their specific operating rule is conducted and appropriately evaluated. The POI's oversight responsibility is to ensure that the operator's
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compliance efforts are satisfactory.

**NOTE:** The operator-specific requirements of an operator's operating regulations make it impossible for a GACAR Part 142 training center to have a training curriculum approved under the operating regulations. PIs may only approve training center curriculums that comply with GACAR Part 142. Training centers may develop curriculums designed to comply with the operating rules of an operator; however, the curriculums cannot be approved as "meeting" the requirements of those parts. Training center instructors and evaluators are likewise qualified in accordance with a center's approved curriculums and therefore cannot conduct an operator's training without first being qualified by an air operator before conducting any of the operators required training.

- 12) When a center revises one of their core or specialty training curriculums that originally formed the basis of an operator's approved curriculum, the center should advise the operator of the revision.

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**Table 4.9.5.1. Sample—Mass and Balance Curriculum Module Comparison Chart**

	<b>Part 142 Training Center Curriculum Module and Elements</b>	<b>Part 135 Operator Curriculum Module &amp; Elements</b>	<b>Equivalent Training Yes/No</b>
1	Aircraft Manufacturers Mass & Balance Procedures (AFM)	Aircraft Manufacturers Mass & Balance Procedures (AFM)	
2	Definitions	Definitions	
3	Limitations	Limitations	
4	Load Shift/Fuel Management and Use	Load Shift/Fuel Management and Use	
5		Operations Specifications (Appropriate Paragraphs)	No
6		Carry-on Baggage identification and load and storage	No
7		Passenger mass determination—average, surveyed, actual	No
8		Baggage/cargo mass determination	No
9		Cabin Configuration and loading	No
10		Baggage Compartment loading and security	No
11		Operator Computation method (computer)	No
12		Load Manifest preparation	No
13	Testing Module	Testing Module	

**Row Number:**

1: Topic may comply with the operator's approved curriculum. However, the use of company developed flip charts, computers, "WIZ Wheels", etc., may require specialized training. Differences evaluation required.

2 through 4: Topics may comply with the operator's approved curriculum. Differences evaluation required.

5 through 12: Topics do not conform to the operator's curriculum.

13: Applicable to the particular curriculum. Differences evaluation required.

### D. Operator Training At Multiple Training Centers.

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- 1) Occasionally, an operator will request that training be conducted at two or more training centers. These centers may be owned by the same parent company, satellite centers of the same certificate holder, or may be training centers operated by different companies. It is common practice for training centers operated by different owners/companies to take varied approaches to curriculum design and development for the same aircraft M/M/S. These differences often include training equipment, training hours, maneuvers description, operating procedures, and checklists. When evaluated individually each variant may be perfectly acceptable for the specific aircraft; however, as training products for an operator these differences, although subtle, are not consistent with the standardization requirements demanded by operator regulations. To ensure standardized training is provided, it is essential that before authorizing the use of multiple sources of training, the operator and subsequently the POI determine that the same curriculum and syllabus, including courseware, flight training equipment, maneuver descriptions, procedures, checklists, etc., will be conducted by each provider.
- 2) Subtle differences between or among training provider's may not create standardization difficulties for non-certificated operators. However, because operators are required to have their own approved programs, differing curriculum between or among training providers is not authorized. Additionally, an operator is only permitted to have one training program/curriculum for each aircraft type in its fleet; therefore, training conducted by different centers will present a standardization problem if not properly monitored and managed by the operator.
- 3) To qualify a center's personnel to conduct an operator's training curriculums will require the operator to conduct an evaluation of the center's curriculums to determine what, if any, differences exist between the two and provide center instructors and evaluators training in those differences. This process must be repeated for each center authorized to conduct training for the operator. If a contract check pilot is requested, the additional training appropriate to the operator's check pilot training will also have to be completed.
- 4) If POIs have reason to believe that multiple centers can provide the quality training required by the operator's approved curriculum, they may authorize two or more facilities or training companies to conduct the subject training. However, if the POI suspects that an operator curriculum cannot be adequately presented at multiple centers due to differing delivery methods, FSTDs, training hours, maneuver descriptions, qualified personnel, etc., and/or the operator's ability to adequately monitor and audit the training being provided,

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the POI and the operator have the responsibility to limit the number of training providers.

### **E. Training Policy and Procedures.**

- 1) Operators are required to develop and document, as part of their approved program, adequate procedures and policies to ensure all training providers conduct the operator's crew member training as approved. These procedures may be part of the operator's manual used by the operators' flight personnel in conducting its operations and/or contained in the operator's approved training program.
- 2) Operators must establish training policies and procedures to ensure crew members are trained and evaluated in accordance with the policies and procedures that represent the manner in which it conducts its aircraft operations. It is unacceptable to have differences between training/checking and actual aircraft operations or between individual crew members.
- 3) POIs are not to approve requests for outsourced training unless the operator's program contains appropriate policies and procedures to ensure the training conducted by the authorized training provider(s) is in accordance with the operator's approved program.
- 4) An operator that determines a center-developed curriculum is suitable for its use must receive its POI's approval to integrate the subject curriculum into its training program.

### **F. Crew Pairing.**

- 1) Training centers often provide services to operators which must meet requirements of particular operating rules (i.e., GACAR Parts 121, and 135). Under these rules, training programs include checklists, callouts, profiles, approach procedures, and other features that are approved for the specific operator by its assigned POI. Occasionally an operator may not be able to assign a complete crew for its training/checking/testing activities at GACAR Part 142 training centers. When this situation occurs, the training center may provide a qualified crew member that meets the requirements outlined in the operator's training program.
- 2) The GACA promotes the crew concept in operator training and checking to ensure that crew coordination and other flight management issues are adequately and appropriately addressed. Flight training must address the performance of duties as Pilot Flying (PF) and Pilot Monitoring (PM) as described in the air operator's approved procedures. To meet both

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of these seat-dependent training needs, each required cockpit crew position must be occupied by a qualified crew member.

3) It is desirable that each flight training session be scheduled so that two pilots from the same company or air operator may be trained during a single flight training session. The preferred crew pairing is a pilot in command (PIC) and a second in command (SIC). Other acceptable crew pairings are two PICs or two SICs employed by the same operator. Each pilot receiving training should have completed appropriate aircraft ground training, including basic indoctrination, prior to beginning the flight training segment.

### **G. Recordkeeping.**

1) Regulations require an operator to maintain training and qualification records for each crew member, flight instructor, and check pilot. This requirement includes contract instructors and contract check pilot employed by training providers that are authorized to provide training and checking for the operator. The means and methodology of maintaining required crew member records must include an acceptable process to record training, checking, and qualifications of the operator's crew member training conducted by an outsourced training provider. The operator's training program should contain a description of their recordkeeping system as well as describing what records are to be used to comply with each regulatory requirement.

2) Training conducted by center personnel must be documented in accordance with the operator's approved system. Center personnel acting as contract instructors and/or contract check pilot for the operator must also be trained in the operator's records system.

3) Training centers are not required under GACAR Part 142 to maintain an operator's crew member training records when the training was accomplished in accordance with the operator's approved program. Training centers are only required to maintain the records required to support the training accomplished under GACAR Part 142 that leads to airman certification or proficiency. An operator's crew members are not trained and evaluated in accordance with GACAR Part 142. They are trained and evaluated in accordance with the operator's operating regulations and approved curriculums. Therefore, the responsibility for record maintenance remains with the operator.

4) GACAR Part 142 requires training centers to maintain the training records of their instructors and TCEs. When these individuals are also approved as contract instructors

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and/or contract check pilot for an operator, it may also make sense for the operator to have its instructor and/or check pilot records maintained by the center. It is, however, the responsibility of the operator to ensure that all crew member records are readily available for inspection as required by applicable regulations.

5) Operators must ensure that training records developed and maintained by their training providers are available in a timely manner. Records of crew member training and checking are required to be furnished to the operator upon completion (within 24 hours) of any training and/or checking in order to enable the operator to determine qualifications for crew assignment(s). Training and qualification records for contract instructors and contract check pilot must also be made readily available to the operator.

### **4.9.5.13. REQUIREMENTS TO AUTHORIZE CONTRACT FLIGHT INSTRUCTORS AND/OR CONTRACT CHECK PILOT FOR AN OPERATOR.**

**A. Requirements.** The operating rules require operators to provide enough flight instructors and check pilot to conduct the flight training and flight checks that are required by the applicable operating rules.

1) The determination of a “sufficient” number of contract check pilot and/or contract instructors for a particular operator will require a careful evaluation of the following:

- Number of aircrew program designees authorized by the GACA and employed by the operator
- Geographic location of the operator with respect to available GACA support
- The operators understanding that they are required to provide surveillance and supervision of their contract instructors/check pilot
- Availability of simulators and location relative to the operators crew member domiciles
- Operators required crew member training and evaluation workload

2) There is no fixed formula that will definitively answer the question of how many contract check pilot/instructors are appropriate. Maintaining an equitable balance between the

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operator's ability to provide required management oversight and surveillance, while meeting their evaluation requirements without compromising standardization or safety, is a primary concern.

**B. Qualification and Training Requirements.** The qualification and training requirements for individuals to become contract flight instructors and/or contract check pilot for an operator are outlined in the specific regulations governing the type of operation. Training center instructors and evaluators are trained and qualified under GACAR Part 142 (evaluators are designated by the President under GACAR Part 183), which does not mirror the instructor and/or check pilot qualification requirements of an operator. Although some of the instructor/evaluator training required by GACAR Part 142 may be considered equivalent to the instructor/check pilot training required by an operator, the two do not align. The differences between these two regulatory requirements will generate additional training requirements for training center instructors and evaluators selected to provide training and checking services for operators.

**C. Instructors.** In order for a training center instructor to serve as a flight instructor for an operator, the individual must be trained and qualified to instruct in each training segment, module, or element of the operator's curriculum that the instructor will be responsible for providing to the operator's crew members.

- a) The instructors are limited to conducting only the training elements of the operator's curriculums that they have been specifically trained and qualified to conduct and have been authorized by the operator; *or*
  - b) The individual has had previously received the same training, proficiency/competency checks, and observations in the same M/M/S aircraft for another operator operating under the same part.
- 2) Situations where an operator adopts a training center's core or specialty curriculum(s) and the POI approves these curriculums as part of the operator's training program would also mitigate some of the training required by the operator to qualify the subject instructor. In this situation the only training the operator would be required to provide the center's instructor(s) would be limited to any differences that exist between the training center's curriculum(s) (as approved by the PI) and the operator's training curriculum (as approved by the operator's POI).
- 3) The operator's POI has the responsibility to determine if the manner and method

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proposed by the operator to train and qualify the center's personnel on curriculum differences, will meet the operator's training requirements.

**D. Review.** To ensure the center's personnel meet the operator's check pilot standards, the operator will need to review the individual's training history and qualifications. Elements of the center's instructor/TCE training curriculums that the operator finds equivalent to their training program may, with the POI's approval, be credited toward the completion of the operator's instructor/check pilot curriculums. If the center's curriculum has been submitted to the POI for approval and is approved as meeting the requirements of the operator's curriculum, other than the operator-specific items, no additional training for the center's personnel would be required. Any differences or deficiencies noted will require the operator to develop a training module to ensure all regulatory requirements are met in order to qualify the center's personnel as contract check pilot.

### **E. Training of Instructors and Evaluators.**

1) Because the typical training program offered by the training center currently does not include all of the ground training subjects contained in an operator's curriculum, it follows that neither the trainees nor the instructors and evaluators themselves receive training in those subjects. It is important to ensure all training center instructors and evaluators are trained and evaluated in all subjects that the center is contracted to conduct. Therefore, if a training center evaluator is not qualified to evaluate subjects other than those contained in the center's core curriculum then a trainee should not be evaluated in those subjects by the same individuals who are not qualified in the operator's procedures.

**NOTE:** To preclude any confusion concerning a contract check pilot's authorization, the POI must specify in each contract check pilot's LOA what specific subjects the check pilot is authorized to test and check.

2) Particular caution must be exercised to ensure that individuals being nominated by an operator to become contract instructors/check pilot have a good understanding of the issues typically faced by crew members on a daily basis, many of which are learned only through the completion of an operator's initial new hire training curriculum. Knowledge of an operator's operational environment becomes very important when instructors/check pilot may be required to draw upon that knowledge to ensure that the quality of training and evaluations demanded by the regulations is not compromised. Non-aircraft-specific issues

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such as flight following/dispatch, MEL/CDLs, company SOPs, etc., play an important role in a crew member's training; especially during LOFT events. To effectively function as an operator instructor/evaluator, individuals must have a good understanding of these issues.

**F. Proficiency Evaluations.** The proficiency evaluations required by an operator to qualify and maintain the currency of its check pilot are also applicable to center personnel that are being nominated as contract check pilot for the operator.

**G. Contract Instructors/Check pilot.** Training center employees that have been qualified by an operator to serve as a contract instructor/contract check pilot may be considered qualified to act in the same capacity for another operator provided that:

- 1) Both operators are certificated under the same GACAR part.
- 2) Both operators are operating the same M/M/S of aircraft with identical configurations.
- 3) Both operators are using identical training curriculums, including checklist and operating procedures.
- 4) The requesting operator finds the subject individual acceptable as a contract instructor/check pilot.
- 5) The subject instructor/check pilot has met the operating or observation experience requirements for at least one operator for which they are providing services. For example, if a training center instructor is qualified to provide instruction in a particular aircraft for three different operators, the instructor may be considered to have met the initial and recurrent line operating or observation requirements for all three by remaining qualified in one of the operator's programs.

**H. Reports.** The POI should arrange to have the operator provide the POI with a periodic report of each check pilot's checking activities, including a pass/fail rate, to coincide with the POI's periodic review (annual, semiannual, or other). POIs may arrange for these reports to arrive at a time that meets the POI's needs. A contract check pilot should be active enough to retain the required knowledge and skills. Usually a check pilot should conduct at least eight authorized check pilot activities during a 12-month period in order to retain the required knowledge and skills.

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#### **CHAPTER 9. PART 142 ADMINISTRATION**

##### **Section 6. Evaluate Training Programs, Curricula, Flight Training Equipment and Recordkeeping Requirements for Part 142**

**4.9.6.1. GENERAL.** The information in this section provides guidance for the approval of a training center's training program and associated curriculums/courses. Regulatory requirements demand sufficient content and detail to enable a training center to meet the standards required to ensure the highest level of flight training is achieved. The successful development of program curriculums and courses forms the basis of each center's certificate. The successful evaluation of the curriculums, syllabi, courseware, and flight training equipment is critical to the success of the program.

**NOTE:** The term principal operations inspector (POI) will be used throughout this section to signify the POI of an air operator and the term principal inspector (PI) will be used throughout this section to signify the PI of a GACAR Part 142 training center.

**4.9.6.3. COMPONENTS OF A TRAINING PROGRAM.** A training program consists of all of the curriculums, syllabus, supporting courseware and materials, facilities, flight training equipment, recordkeeping, and personnel necessary to accomplish a specific training objective(s) (e.g., a Boeing B-737-400 training program). A training program may include core curriculums, specialty curriculums, or both. Other curriculums may be used to augment the training covered under a core or specialty curriculum. The technical evaluation of components of a training program must involve the assistance of a General Authority of Civil Aviation (GACA) aviation safety inspector (Inspector) qualified in the particular aircraft. Should the POI be unqualified in the aircraft or lack the expertise to conduct a review of this type, support should be requested from the Director, Flight Operations Division to provide a qualified specialist.

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**Figure 4.9.6.1. Components of a Training Program**



**4.9.6.5. Curriculums Presented for Approval.** Present curriculums submitted for approval in a format that describes the content of the proposed training in sufficient detail to enable a clear understanding of subject matter and events to be accomplished. The content of each curriculum or course segment is outlined by listing the main subject areas. Each subject area contains individual training modules for each topic to be covered (see Figure 4.9.6.2).

**Figure 4.9.6.2. Sample Curriculum Format**

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Curriculum/ Course	Initial Pilot-in-Command-(PIC)—Gulfstream 550 Type Rating				
Modules/ Elements	⇒ G-550 Initial System Training      General Operational Subjects      FMS training      G-550 Differences      G-550 PIC Initial Simulator Flight Training				
	G-550 Initial System Training	General Operational Subjects	FMS training	G-550 Differences	G-550 PIC Initial Simulator Flight Training

### A. General Authority of Civil Aviation Regulations (GACAR) Part 142 Approved

**Curriculums.** Training center curriculums that are approved in accordance with GACAR Part 142 are divided into two basic types: core (airman certification) or specialty (other regulatory training requirements).

### B. General Characteristics of a Curriculum.

1) Each approved curriculum must be supported by a revision system that includes:

- Sufficient detail to evaluate the proposed revision including substantiation for the proposed revision and any associated instructor training and qualification requirements
- Margin side-bars that mark changed areas
- The revision number and date on each revised page

2) The curriculums must represent the flight training equipment to be used by the training center. This must include training in systems (including installed equipment, modifications, and avionics), as well as maneuvers and procedures appropriate to the make, model, series, and in some cases, serial number of the aircraft represented by the flight training equipment. Training in other variants of the same make/model aircraft not represented by the flight training equipment should not be approved as part of a core curriculum. These variations if requested should be treated as differences and become a specialty curriculum or differences module as appropriate.

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- 3) Curriculum terminology should be consistent with that used in relevant guidance documents and materials (practical test standards (PTS), etc.). Use of terminology such as “as required,” “as applicable” and other terms that indicate training in that topic is a variable is not acceptable for inclusion in training modules or elements.
- 4) Curriculums must include an introduction that provides a general overview of the training to be accomplished and state a specific training objective. The objective should support the expected outcomes. Course objectives must identify the certification expected, what flight training equipment will be used, as well as the regulatory requirements that will be met. The objective should indicate the specific aircraft variant(s) that will be covered. Differences training for variants within type or groups may be treated under a separate specialty curriculum.
- 5) The curriculums must state the specific student prerequisites for entry into the curriculum. This should include specific flight experience (including currency), previous training, minimum pilot certification, and qualifications. Common errors include allowing an applicant with an airplane multiengine class rating that is limited to center-line thrust, to enroll in a 100 percent simulator course for a multiengine airplane type rating.
- 6) The curriculums must specify in sufficient detail what ground training will be accomplished. The ground training segment of a curriculum that leads to airman certification or proficiency consists of training in general operational subjects, aircraft systems, and systems integration. Each module must list a sufficient number of elements to describe main topic areas to be covered within that module. Ground training must be predicated on the flight training equipment to be used in the course. The curriculums must indicate what criteria and standard will be used to determine satisfactory completion (e.g., completion of a written test on systems and procedures with a grade of 80 percent, which will be corrected to 100 percent).

**NOTE:** Ground training conducted under a curriculum leading to airman certification must be satisfactorily completed before the start of the associated flight training.

- 7) GACAR Part 142 does not specify programmed hours for flight crew members. When approving curriculum segments and their associated training hours as proposed by the training provider, PIs must consider the complexity of the operation and specific aircraft make, model, and series (M/M/S). For example, training hours for a complex operation may

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need to be increased and for training that is not as complex a reductions in hours may be acceptable. PI's will need to use their best judgment in making these determinations.

8) The curriculum must provide an outline of the flight training (maneuvers and procedures) and practice that will be accomplished during each flight-training period. Flight training sessions/periods are referred to as training modules. Each module must be appropriate to the flight training equipment being used and reflect the specific maneuvers or procedures to be accomplished during that training session/period. The curriculum must allow sufficient time for practice and review as well as provide the instructor sufficient opportunity to demonstrate the use of all equipment identified in the training session.

9) The curriculum must indicate the individual maneuvers and procedures that will be practiced during each training period. It is common for a particular maneuver to appear in multiple training sessions depending on the maneuver's complexity. The curriculum must indicate what standards will be used to determine student progress. If an aircraft is used, indicate only those events accomplished in the aircraft. Training in specific types of instrument approach procedures (IAP) must be identified for each session to ensure adequate training in all equipment, procedures, and techniques.

10) A curriculum that provides training, testing, or checking to accomplish certification or proficiency requirements of GACAR Part 61 must include all of the appropriate practical test standards (PTS)-required maneuvers. If the flight simulation training device (FSTD) is not qualified and approved to accomplish a particular maneuver, for example a circling approach, the student training record must reflect that the maneuver was not accomplished.

**NOTE:** PTS that are not appropriate for a particular aircraft M/M/S need not be included in that aircrafts training/testing/checking modules.

11) Curriculums may not include maneuvers or systems training in an area or event that the center does not have the courseware or training devices suitable for conducting the subject training. For example, global positioning system (GPS) approach training will not be approved for training if the center's FSTDs do not have an operable GPS installed.

12) The training, testing, and checking presented by the curriculums must be specific to that M/M/S (serial number, if applicable), and variant of the aircraft represented by the flight training equipment to be used by the center. Differences training between or among variants of the same type are not required of all students but if a specialty curriculum is developed to

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satisfy training requirements for different variants, it must identify how differences training will be accomplished. A center may address differences training by:

- Create a separate specialty curriculum
- Adding one or more modules to the core curriculums, and allow for those modules in the programmed hours

**NOTE:** In some cases, a separate core or specialty curriculum may be necessary to describe the training for a variant of an aircraft type when the differences have been determined to be so significant that ground training, flight training, and checking are required. Some series of aircraft can be operated under the same type rating but require a dedicated simulator to provide the training for that particular variant (e.g., Lear25 vs. Lear35, B-737-200 vs. B-737-800, etc.).

13) Curriculums will also include qualification module(s) that state the basis and standards for satisfactory course completion and evaluation (testing/checking accomplished to what standard).

**4.9.6.7. FLIGHT TRAINING EQUIPMENT (FSTD).** Training centers may use a variety of training devices in their approved curriculums. However, each core curriculum must be supported by a flight training device (FTD) (Level 6 or 7) or full flight simulator (FFS) (Levels A through D), which must be used to the maximum extent possible for all associated training and testing/checking.

**A. Qualifying Flight Training Equipment.** The GACA or a foreign authority recognized by GACA, must qualify the flight training equipment used to accomplish the flight training, testing or checking requirements of a core specialty curriculum. The evaluation conducted will assign the appropriate training device “level” to each FSTD. The awarded training device level may be used to determine the training maneuvers that are permitted to be accomplished in the device. Appendix 1 of the appropriate PTS (except Private Pilot) identifies the tasks that may receive credit with an appropriately qualified training device.

**B. Evaluating and Approving Training Equipment.** Following the qualification of a particular FSTD, the PI must evaluate and approve the device for use in the center’s approved training program. This approval will include the specific curriculum, particular maneuver, procedure, and/or crew member function permitted to perform in the device. GACAR Part 142 requires the training center’s flight training equipment to be appropriate for and adequate to support the

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curriculum goals and each curriculum. The flight training equipment must represent the specific aircraft M/M/S, variant, and in some cases, serial number of the aircraft represented by the training device and curriculum. When describing flight-training equipment, the curriculum must use terminology consistent with the level of qualification authorized for the particular device.

**C. Evaluating and Approving Full Flight Simulators.** FFS are qualified as a Level A, B, C, or D flight simulators and are approved for use in training, checking, and testing under an approved curriculum must represent the M/M/S, variant, and in some cases serial number range of the aircraft training described by the curriculum. The simulator must be equipped/modified to include mandatory aircraft modifications. Each simulator must meet and maintain the standards established in GACAR Part 60, or the original qualification basis under which the original evaluation took place.

1) Some curriculum modules or elements require a specific visual scene to accomplish a particular training event. These events may require an accurate representation of the airport, its lighting, the surrounding environment, etc. For example:

- Special airports and approaches
- Approach and landing using visual (ground or airport) references
- Surface Movement Guidance and Control System (SMGCS) training
- Line-Oriented Flight Training (LOFT)
- Circling approaches
- Other special circumstances

2) With respect to the circling approach, the GACAR Part 60 qualification includes an evaluation of the simulator's ability to conduct the circling maneuver. However, the PI is responsible for evaluating and approving each proposed circling approach to be used for training, checking, or testing.

**NOTE:** The criteria for performing a circling approach during a certification flight (i.e., PTS) are different from the criteria for developing an instrument approach procedure. The PTS requires evaluation of circling approaches to a landing runway heading that is at least 90

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degrees to the final approach course. Instrument approach procedure design criteria requires publishing a circling approach when there is more than a 30 degrees course difference between the landing runway and the course at the final approach fix position.

3) In order for a training center to conduct training, testing, and checking with inoperative components, the center must develop an approved Missing, Malfunctioning, or Inoperative (MMI) equipment policy. This policy outlines the training, checking, or testing that will not be permitted when a component is inoperative. Although similar in effect, the training center must not use an aircraft minimum equipment list (MEL) to determine the operational status of FSTDs. The training center must develop as a part of its MMI policy a program for managing the repair of items, the use of the device in the degraded condition, and notification of the appropriate personnel of training restrictions. MMI management policies require the POI's approval in order to be used in an approved training curriculum.

### D. Advanced Flight Training Devices (AFTDs).

1) AFTDs. Describes a type of FTD that accurately replicate a specific make, model, and type aircraft flightdeck, and has handling characteristics that accurately model the aircraft handling characteristics.

2) *Equipment Approval.* After determining that the flight training equipment is appropriately equipped, and capable of accomplishing the curriculum requirements the PI issues approval for the AFTD to be used in a training program. The approval must specify any limitations, as appropriate. Approval to use a particular AFTD is authorized through the training center's OpSpecs.

3) *Daily Inspection Requirements.* Each AFTD must be given a functional preflight inspection each day before use. As part of the approval process, the PI must determine if the training center has a procedure for accomplishing and documenting required preflight inspections. Preflight inspections will be conducted in accordance with a predetermined list of inspection items that are acceptable to the PI and must include a method of logging deficiencies.

4) *Operating Deficiencies.* Regulations require that each AFTD have a method to log discrepancies and to advise instructors and evaluators that training must not be conducted in events that rely on the inoperative equipment. PIs must determine how the training center will identify, record, and resolve discrepancies. Training center must have in place a quality

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control system for discrepancies that provides instructors and evaluators with information on equipment status prior to the conduct of evaluations or instruction.

5) *Maintaining Qualifications.* As part of the process for maintaining the AFTDs qualification, the GACA should conduct periodic evaluations to insure standards and performance of the equipment are being maintained.

- a) These evaluations may discover deficiencies that require a restriction to training, checking, or testing be imposed. The AFTD's sponsor and the PI will receive a list of all deficiencies. The PI will review all forwarded discrepancies and determine if the training approval for the device will need to be restricted until the training center resolves the discrepancies. PIs are responsible for the continued surveillance of the centers AFTDs and may place a limitation/restriction on training, testing, and testing at any time when deficiencies are noted.
- b) The resolution of discrepancies is the responsibility of the sponsor. It is also the responsibility of the sponsor to advise the PI in a timely manner that discrepancies, which have led to maneuver restrictions, have been repaired.

### **E. Aircraft Training.**

1) Aircraft-only training programs or core curriculums will not be authorized or approved for use by a training center certificated under GACAR Part 142. The primary form of flight training and testing/checking will be based on FSTDs. An aircraft may only be approved for use to supplement the training, testing, or checking that cannot be accomplished in a FSTD. Limited training and testing as permitted by the regulations may be accomplished in an aircraft to avoid issuing a pilot certificate with limitations (e.g., supervised operating experience). If an aircraft is approved for use, each training center must insure that each aircraft is maintained and inspected in accordance with GACA-approved maintenance and inspection program, maintenance requirements approved by the country of registry, or operator approved maintenance program. Each training center certificate holder must ensure that each aircraft that it proposes to use is equipped and capable of conducting all maneuvers and procedures required by the approved training curriculum in which it is to be used.

2) Training centers that employ the use of an aircraft in their curriculums as a means of completing required certification tests/checks, due to the use of training devices or

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simulators that do not qualify for 100 percent training/checking are not required to designate the aircraft as a training site. The aircraft and its location are considered a part of the principals or satellites center for the purposes of the regulation. The aircraft and/or the facilities where the aircraft is located are not considered as an individual training site in the context of the rule, and are not required to be individually designated as a remote training site. The facilities where an aircraft is located must, however, be suitable for pre-and post-briefings in the context of the regulation and must be appropriate for their intended purpose.

### **F. Line Operational Simulation (LOS) and Line Oriented Flight Training (LOFT).**

1) *LOS*. LOS is a broad classification of activities that can be accomplished in a simulator to represent/duplicate/validate real-life flight situations. LOS is an integral and necessary part of any training curriculum that leads to issuance of an initial pilot certificate or the addition of the type rating to an existing certificate entirely in a Level C or Level D FFS. It is included in an airman certification curriculum as an alternative to flight time in the actual aircraft before qualification.

2) *LOFT*. LOFT is designed to provide training and to transition the pilot from maneuver-oriented flight training (in which systems knowledge and operating skills are initially learned and practiced) to operational flying, which involves the application of skills and knowledge, crew coordination, and all other aspects of operating the aircraft in typical service. It provides the opportunity to observe crew member actions, including areas such as Crew Resource Management (CRM), standard operating procedures (SOP), practical application of aircraft knowledge, and other training areas. LOFT provides a good opportunity to ensure training in the special-emphasis areas in the PTS and other GACA guidance is accomplished. It may also help determine if an airman requires additional training in a particular area.

a) A curriculum that is approved under GACAR Part 142 and that accomplishes 100 percent of the required training and testing for initial airman certification or additional rating in a Level C or D FFS must contain LOFT. LOFT is not required if an actual aircraft is to be used for part of the practical test. LOFT is required on an annual basis for certain simulator instructors approved under GACAR Part 142 and may be required to meet certain training and qualification requirements under GACAR Part 121 (per GACAR 121, Appendix D (a)(6)).

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b) LOFT is *training*; it is a learning experience in which errors will be made. It is not a checking program in which errors are unacceptable. To ensure that maximum benefit from LOFT is obtained, the session must be scheduled after satisfactory completion of the maneuvers-based portion of the curriculum and prior to the certification test.

### 3) *Characteristics of LOFT.*

a) Training Time. A LOFT session should use realistic routing between aerodromes so as to encompass a normal simulator training period (e.g., if the normal period is 2 hours per crew member, the LOFT in the simulator should be 2 hours for each crew member exclusive of any breaks). Comprehensive briefing and debriefing are essential to effective LOFT exercises. However, the briefing and debriefing time is not part of the flight training time. The preflight briefing time should be used to brief the applicant and allow the crew members to perform preflight planning. The planned hours of instruction specified in a curriculum/syllabus must exclude LOFT except for the time the applicant is participating in the flight portion of the LOFT. Because PIC duties, functions, and capabilities are the emphasis during LOFT, only time spent at controls during LOFT is creditable toward programmed curriculum time. Any LOFT conducted after airman certification cannot be credited toward the curriculum times.

b) Crew Qualifications. Participating crew members must be fully qualified in accordance with the requirements of GACAR Part 142 and the curriculum trained. They must be knowledgeable and proficient in all aspects of the training taught by the center as part of the curriculum, including checklists and SOP.

c) Stated Objective. The LOFT must state training objectives. Objectives may be broad in scope such as CRM, workload management, etc., and/or can have a specific objective such as a specific area of operation that has been determined to require special emphasis. The problems presented during the LOFT scenario can be further categorized into two types:

1. A simple problem that has no further impact on the conduct of the flight once diagnosed and corrected.

2. A complex problem that is not correctable and continues for the duration of the flight. LOFT requires the flight to continue to the ultimate outcome without stopping unless a crew action corrects the abnormal or emergency situation.

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d) Scenario description. LOFT scenarios must be highly structured and simulate flight from startup to shutdown in real time without any freeze, slow motion, or other activity that might not be accomplished in an actual flight in an aircraft. LOFT should include the following:

1. The flight should represent the type of operations reflected in the training being conducted.
  2. LOFT should reflect training in knowledge and skills required by the training center's approved core curriculums—not those unique to a particular operator.
  3. A complete scripted scenario simulating total line operational environment must be developed by the training center. This would include a detailed script that includes all communications expected during the flight. Scenario communications should consider that the LOFT instructor is functionally not present in the simulator but is available for communications as ATC, maintenance, flight service, ground operations, etc.
  4. LOFT scenarios should be designed based on the stated objectives and desired outcomes and must include normal, abnormal, and emergency procedures. If two PIC students train together, LOFT may consist of two segments; in which one segment is conducted with normal procedures, and a separate segment incorporates abnormal and emergency procedures. Alternatively, different scenarios may be developed for each student to prevent repetition. If the curriculum permits a single PIC student to train, LOFT may consist of one flight segment that contains normal, abnormal, and emergency procedures.
  - 4) *Preflight Planning and Briefing.* Comprehensive preflight planning appropriate to the type of operations conducted must be part of LOFT to enhance realism and represent actual aircraft operations. This will require a complete navigation and weather package, including Notices to Airmen (NOTAM) that may affect the flight. This should include en route, alternate, and departure airports as well as destination weather. Flight planning for the LOFT must consider fuel planning, mass and balance, and aircraft performance for a realistic route from departure to destination airport and support the stated objective(s) of the LOFT.
  - 5) *Simulator Capability.* LOFT may be conducted in Level C and Level D FFS only.
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Dedicated aerodrome scenes revised to represent current aerodrome facilities, including runways/taxiways and navigation facilities must be used for realism (generic visual representation of aerodromes is not acceptable). Both en route and terminal navigation facilities must agree with navigation charts. LOFT should be developed for the M/M/S, and modification status of the aircraft represented by the simulator.

6) *Instructor Training.* For LOFT to be a valuable training experience, instructors must be given specialized, specific instruction on the scenarios, the techniques for conducting LOFT, and the post flight evaluation. The briefing/debriefing process is extremely important and requires special techniques and training for instructors. Instructor training programs must include documented training in these areas.

7) *Approval.* In accordance with GACA policy, all materials used to conduct LOFT as part of a GACAR Part 142 curriculum will be evaluated and approved by the PI. Such items as instrument navigation charts (approach and en route) are not part of that approval since navigation procedures and aerodrome facilities at an aerodrome may change. Only current and accurate representation of aerodrome and navigation facilities will be permitted during LOFT. The training center should periodically review and revise LOFT scenarios to prevent complacency or to accomplish a different objective.

### 4.9.6.9. COURSEWARE.

**A. Definition.** Courseware is the instructional material developed for each curriculum. It consists of lesson plans, instructor guides, computer-based training, audiovisual materials, training manuals, workbooks, aircraft operating manual(s), handouts, and any other materials used to support the training curriculum. Courseware must accurately represent and support the proposed training curriculum.

**B. Evaluation.** All courseware used to accomplish training must be evaluated by the PI as an integral part of the overall training program. When reviewing courseware, the PI should not accept the use of computerized and tabulated performance figures, proprietary mass and balance data, minimum equipment lists that require a call to a proprietary maintenance base, and use of a dispatch service that may not be available to the student upon completion of training at the training center.

**C. Acceptable and Unacceptable Courseware.** Courseware must be acceptable to the GACA prior to and during the time curriculum approval is in effect, and must be identified (revision

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status) in a manner that ensures that only current materials are used to accomplish training. The training center must present courseware (including revisions) to the PI before use for review and approval. The PI must notify the training center in writing of any courseware that is determined to be unacceptable. Courseware is subject to the revision provisions of GACAR § 142.41(d) and (e).

### **D. Pictorial Aircraft Preflight Inspection Courseware.**

- 1) The preferred method to accomplish aircraft preflight inspection training, testing, and checking is to use an actual aircraft. In situations when an aircraft is not available, a training center must have approved pictorial courseware for each curriculum to conduct training, checking, or testing. In situations when an aircraft is used to complete any training, checking, or testing, the actual aircraft must be used.
- 2) The PI must approve pictorial courseware for preflight training, checking, and testing. A review of the content must be accomplished with the assistance of an Inspector qualified in the aircraft.
- 3) The following guidance for pictorial courseware will apply:
  - a) The strategies for training are different from the strategies for checking and testing when using pictorial courseware. The optimum training results may be achieved through the use of video, interactive computer-based instruction, and pictorial displays of the make, model, and series of the aircraft represented by the flight training equipment being used. To allow for positive learning transfer, the trainee should view preflight items in the same configurations as when using a static airplane. However, it is also beneficial to discuss abnormal conditions in training.
  - b) For checking and testing, slides are effective pictorial courseware. When used during checking and testing, pictorials should include abnormal conditions in a sufficient number to permit a reliable evaluation of the applicant's knowledge and ability to conduct a preflight inspection.
- 4) The following are required to be part of an approved pictorial preflight inspection courseware:
  - a) Detailed pictures of each interior and exterior aircraft preflight checklist item,

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including pictorials of the overall aircraft and major sections of the aircraft, showing the location and relationship of specific inspection items.

- b) Capability for random, rapid access to any picture.
- c) The opening, closing, and securing of entrance or baggage/cargo doors. Video may be used to train in these or any areas that require an understanding of how a component operates.
- d) Internal and external items and any preparatory or safety related items, such as positioning or securing landing gear doors or landing gear locks before or after the inspection, or cockpit safety check.
- e) Pictures of each passenger compartment and each preflight inspection item.
- f) Depiction of normal and abnormal conditions.
- g) Sequence of pictures should match the sequence of the preflight inspection.
- h) Use of models, mockups, components, cutaways, and expanded views to depict details or function of inspection items.

5) The following are specific characteristics:

- a) Pictorial courseware must contain pictures of each item on the aircraft preflight checklist.
- b) The opening, closing, and securing of aircraft doors must be trained and evaluated.
- c) The aircraft should be shown in a typical prior-to-flight condition, which may include the support people and equipment, (e.g., fueling, cleaning, and catering) normally associated with flight preparation.
- d) Nothing should obstruct the view of the preflight item (jetways, fuel trucks, workstands, etc.).
- e) The pictorial series should feature the same or identical aircraft as represented by the

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flight training equipment be used for training. In some cases, use of a dissimilar aircraft may be justified to depict differences. Pictures should be representative of the specific aircraft in which the pilot certification will be conducted.

- f) Text or voice manuscript should be available for and match each picture used for training when an instructor is not presenting the training.
- g) The courseware should be high quality, and projection equipment should have random and rapid access capability. Examples of unacceptable quality include low-resolution copies of photographs, videotape systems without random and rapid access capability, or any other pictorial system that is markedly inferior to use of a static airplane.
- h) For optimum effective training, the pictorial preflight courseware used in training should be different from that used during evaluation. Some of the pictures used for testing or checking should be different from those used for training. Abnormal conditions of preflight items must be introduced during evaluations and in sufficient number to permit a reliable evaluation of the applicant's preflight ability.
- i) For checking and testing, abnormal features should not be shown in pictures intended to depict normal aircraft conditions.
- j) Pictures of abnormal conditions should be maintained to permit comprehensive coverage. In particular, pictures should include those abnormal conditions that are likely to be encountered during preflight inspection and those which are potentially unsafe.
- k) Unless an abnormal condition is intentionally depicted for checking and testing, pictorials illustrate as follows:
  1. All permanent parts should be in place and in normal condition, such as windows and doors, windshield wipers, antennas, panels, etc.
  2. All removable parts, such as engine cowls and access panels, should be in place and in normal condition (engine inlets should be shown with covers removed).
  3. Aerodynamic surfaces, wheel well doors, flaps, slats, and other devices should

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be in the configuration that they are normally before flight.

4. People and equipment associated with assembly or maintenance work should not be in the illustration.

l) The preflight procedures contained in the Aircraft Flight Manual (AFM) are the standard references for the preflight visual inspection. They are primary for determining essential preflight items and the sequence in which those items should be inspected.

m) Approval is granted by the PI in writing. To ensure continuity, the PI must require pictorial courseware to be identified with a title and control number or revision to which an approval is tied. Pictorial preflight courseware is subject to the revision requirements of GACAR § 142.41(d) and (e).

### **E. Lesson Plans.**

1) A lesson plan is a written, organized outline that provides detailed content of a single instructional period. It provides the instructor with a guide as to what specific knowledge or skills are to be taught as well as completion standards. It includes planned instruction time and sequence to ensure effective use of time.

2) Each training center must have lesson plans to implement each curriculum and syllabus and must be developed by the training center to support the curriculum with appropriate content and programmed training times. Lesson plans must contain detailed information concerning the conduct of each flight or ground training session to ensure consistency of training throughout the training center and standardization among instructors. The lesson plans should provide detailed information on all elements and events specified in the curriculum and indicate training times that equal or exceed the times specified for the curriculum.

3) Lesson plans are courseware and are the indicators that the instruction will flow in a logical sequence and in concert with the other training aids and the approved curriculum. They must cover the same information as required by the curriculum and syllabus. Lesson plans must be reviewed as part of the courseware and must be acceptable to the GACA prior to issuing OpSpecs that authorize the curriculum to be taught. Deficient lesson plans are subject to the revision provisions of GACAR § 142.41(d) and (e).

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### **F. Aircraft Operating Manuals, Checklists, and Quick Reference Handbooks.**

- 1) The training center must use the AFM as the basic training reference for systems information, description, operation, performance planning, checklists, and mass and balance procedures.
- 2) The training center must provide as part of the curriculum courseware any aircraft operating manuals, checklists, and quick reference handbooks (QRH) that will be used for training, testing, and checking under a GACAR Part 142 approved curriculum. As with any courseware, the checklist/QRH used for training, testing, or checking under an approved curriculum must be reviewed and accepted. The evaluation of a checklist or QRH proposed by the training center must be conducted by the PI using the AFM.
- 3) The aircraft operating checklists used in FSTDs and aircraft, under approved training center programs must be reviewed and becomes a portion of the approved courseware for use in those programs.
- 4) Training centers that are conducting training for certificated air operators are required to follow that operator's SOPs during all training and checking on behalf of that operator. Certificated operators are required to use their approved/accepted checklist for all training and checking and as a result, their checklist policies and procedures are governed by their respective principal operations inspector (POI) and not subject to revision by the operator or training center without specific approval. Checklists authorized for use in GACAR Part 142 curriculums must:
  - a) Be the checklist approved by the PI as a part of the training center's approved curriculum for the specific aircraft M/M/S.
  - b) Accurately reflect the configuration and systems of the flight training equipment and must not deviate from the aircraft manufacturer's current checklist or a checklist that is in compliance with requirements listed below.

### **G. Audiovisual Programs, Computer Software Programs, Training Manuals, Workbooks, Handouts, and Other Courseware.**

- 1) These training materials are approved as an integral part of the overall training program subject to the revision provisions of GACAR § 142.41(d) and (e). They should be identified

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with a control date or other form of revision control.

2) The PI must evaluate all courseware used to accomplish training as an integral part of the overall training program. Courseware must be acceptable to the GACA prior to and during the time curriculum approval is in effect and should be identified in a manner to ensure that only current materials are used to accomplish training. Courseware must be presented to the POI before introduction (including revisions) for review and acceptance. The PI must notify the training center in writing of any courseware that is determined to be unacceptable. Courseware is subject to the revision provisions of GACAR § 142.41(d) and (e).

**H. Facilities.** Each training center and training center applicant must have a training room, training booth, or other space used for instructional purposes that is heated, lighted, and ventilated to conform to local building, sanitation, and health codes. Each training facility must provide students with an environment free from the distraction of other classrooms or flight and maintenance operations.

### **I. Maneuvers/Procedures Descriptions (Including SOP).**

- 1) To facilitate learning, the training center must develop and provide to students descriptions (written and/or visual) of how to perform each maneuver or procedure to be accomplished during training. This should include SOPs that state the briefing procedures, crew callouts, etc., to be used in training, testing, and checking for each course involving flight-training events.
- 2) Descriptions of the maneuvers and procedures (also referred to as profiles, or flight maneuvers and procedures document) explain how these events will be performed. Descriptions must be provided for each training program. The descriptions must comply with all limitations of the AFM and be consistent with requirements and conditions of the PTS and the regulations.
- 3) The maneuvers/procedures descriptions and SOPs are courseware and must be developed and evaluated as part of the approval process for any new or revised curriculum. Maneuvers/procedures are knowledge and skills related to the transport of dangerous goods.
- 4) Recurrent training program including an examination to determine competence approved by the PI as an integral part of the overall training program and are subject to the revision

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provisions of GACAR § 142.41(d) and (e).

### **J. Training, Testing, and Checking.**

- 1) Under GACAR Part 142, training, testing, and checking can be accomplished in four categories:
  - a) Initial Training. This category includes initial training for an air transportation pilot certificate, a type rating, or initial training as second in command (SIC).
  - b) Upgrade Training. This category of training applies to an airman who is currently serving as a SIC who wishes to become PIC qualified on the same aircraft. This category of training may include foreign pilots with a foreign type rating applying for a Kingdom of Saudi Arabia (KSA) airmen certificate with an appropriate type rating.
  - c) Requalification Training. This category of training is for those airmen that are PIC or SIC-qualified, but who are not currently operating the aircraft, or whose PIC proficiency check has expired.
  - d) Recurrent Training. This category of training is for PICs (or SICs) who are currently operating the aircraft or have a valid PIC proficiency check.
- 2) Ground training time for airman certification may not include training in ground training subject areas that occur after the ground training course or segment has been completed and completion/qualification standards have been accomplished. Specifically, using briefing time preceding or following a simulator training session as programmed ground instruction time is not acceptable.
- 3) For any curriculum involving airman certification, the appropriate ground training modules or segment must be satisfactorily completed before start of the associated flight training lesson(s).
- 4) Time spent completing or attempting to complete a practical test does not count toward the minimum programmed time.
- 5) Training completed after the qualification segment of a curriculum has been completed may not be credited toward the curriculum programmed hours.

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6) The time spent by the airman actually manipulating the controls from the PIC seat during LOFT may be a part of the minimum programmed hours.

### **K. Permissible Crew Pairing During Training, Testing, or Checking.**

1) Crew pairing for GACAR Part 142 flight training/checking/testing; training centers are required to comply with GACAR § 142.79(b). This specifies that when flight testing, flight checking, or line operational simulation is conducted, each required crew member position must be occupied by either a crew member qualified in the aircraft category, class, and type, or a student enrolled in the same specific course.

2) During testing, checking, or Line Operational Simulation (LOS) conducted under a GACAR Part 142-approved curriculums; each crew member seat will be occupied by:

a) An airman who is GACA-qualified in the same aircraft category, class, and type. This could be a training center instructor who is not providing instruction, or another airman who is qualified in the particular curriculum/course requirements and procedures.

b) A student enrolled in the same specific course (PIC initial training and SIC initial training for the same aircraft may not be the same specific course).

3) The intent of this requirement is to ensure that the pilot being tested or checked is assisted by a pilot who is competent and proficient at performing the duties of the pilot-monitoring (PM). When students are enrolled in courses with different identifiers or names, they may therefore still be paired together in a simulator for testing, checking or LOS activities provided the courses are essentially similar.

4) The same crew member pairing requirements should be used during training in view of the requirement that all training in the simulator or aircraft will be accomplished using the curriculum's approved checklist/QRH. For standardization and effective training, all crew members should be using the same maneuvers/procedures, and operating procedures (including CRM) during a training session.

5) Training centers must develop a written crew pairing policy for GACAR Part 142 training and adhere to this policy. Besides defining how the training center will comply with the intent of GACAR § 142.79(b), this policy should include a requirement for

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English language proficiency and a mechanism for a trainee to elevate a concern regarding an unsatisfactory pilot pairing to center management.

### **L. Acceptable Policy on the Use of FSTD Freeze, Slow Motion and Repositioning Features.**

Compliance with GACAR § 142.79 requires that FSTD freeze and slow motion functions not be used during testing or checking. If operationally necessary and advantageous to a particular scenario, however, it is permissible to briefly suspend a testing or checking event long enough to accomplish a simulator reposition from one point on the ground to another point on the ground (including a different airport) at which the next phase of the test or check will begin. The use of simulator reposition is never required but if it is used, it should be used to the minimum extent necessary to accomplish the required testing or checking scenarios. The following guidelines must be complied with:

- The evaluator must include, as part of the simulator period briefing, the information that at one or more points the test or check will be temporarily suspended while the device is repositioned
- Each time it is necessary to reposition the simulator an announcement must be made that testing or checking is suspended.
- Once reposition is complete, a clear announcement must be made that the test or check has resumed
- Repositioning of the simulator must take place only from one ground point to another, and only after the simulator has been brought to a complete stop

**4.9.6.11. TRAINING FACILITIES.** The training center must provide adequate facilities to assure that each training room or other space used for instructional purposes is heated, lighted, and ventilated to conform to local building, sanitation, and health codes. The training facility must also provide students with a learning environment free of distractions, such as instruction conducted in other rooms or flight and maintenance operations on an airport.

### **4.9.6.13. PART 142 RECORDKEEPING.**

**A. Defining Records.** A record is information preserved in a predetermined format as an account of the occurrence of an event. In general, a record must show what event occurred, when it occurred, who was involved, and proof of the event's occurrence such as certification by

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individual signature.

- 1) Records of airman, instructor, and evaluator training and qualification are an integral part of any training program. A training center certificated under GACAR Part 142 is required by regulation to produce and maintain certain records and to have an approved recordkeeping system. Each student, instructor, or evaluator record consists of all documentation that is required to be maintained on a specific individual. Those documents must be maintained in the same approved location.
- 2) The recordkeeping system must identify what records are used to meet each GACA regulatory requirement. The system must describe in detail the procedures and forms used by the training center for the generation and maintenance of required records. That description may be in an approved manual referenced in the OpSpecs or a detailed description of the records including specific forms one must enter into the OpSpecs. Each form on which a training or qualification record is kept must be identified by a control or revision number to identify that the current recordkeeping system is in use. Revisions to the recordkeeping system, including individual forms, must be approved by the PI.
- 3) A training center may elect to develop and use an electronic recordkeeping system. The system must be capable of generating and maintaining the required records. Use of electronic recordkeeping systems are authorized with OpSpec A25. See Volume 15, Chapter 7 for further details.

**B. Student Records.** Recordkeeping requirements for students are stated in GACAR § 142.91 and should contain the following information:

- 1) The name of the trainee.
- 2) A copy of the trainee's pilot certificate, if any, and medical certificate.
- 3) The name of the course and the make and model of the approved flight training equipment used.
- 4) The trainee's prerequisite experience and course time completed.
- 5) The trainee's performance on each lesson and the name of the instructor providing instruction.

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- 6) The date and result of each end-of-course practical test and the name of the evaluator conducting the test; and
- 7) The number of hours of additional training that was accomplished after any unsatisfactory practical test.

### C. Instructor/Evaluator Records.

- 1) Recordkeeping requirements for instructors and evaluators are stated in GACAR § 142.91. These records must document the qualification, training, and checking requirements of GACAR §§ 142.13, 142.53, 142.55, 142.57, and 142.59, as applicable. The system should contain the following information:
  - a) Eligibility requirements and prerequisites for the position GACAR § 142.55. This includes pilot certificates and detailed flight experience.
  - b) Completion of instructor/evaluator training (GACAR §§ 142.57 and 142.59), including documentation that reflects curriculum content. Instructor and evaluator training are subject to the requirement that each instructor who provides ground or flight instruction under an approved curriculum must record each student's performance on each lesson (ground and flight). The record must also indicate the name of the instructor as well as the training time.
  - c) Completion of the appropriate training curriculum or course in which that individual will instruct.
  - d) Satisfactory completion of written testing requirements.
  - e) Designation as an instructor to instruct in each approved course. The records must identify every course or curriculum assignment and document the duties of each instructor (e.g., ground instructor: Learjet initial and recurrent; differences; simulator instructor: PIC/SIC initial and recurrent, etc.). Designation should not just identify an aircraft type.
  - f) Satisfactory completion of written testing requirements.
  - g) Annual flight experience or line/flight observation, including verification by flight

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crew of participation and time and LOFT.

2) The center's record keeping system must include a method to ensure instructors and/or TCEs are not scheduled to exceed 8 hours of instruction and/or evaluation duties in any continuous 24-hour period, excluding briefings and debriefings. This system must also identify the method the training center will use to prevent an instructor or TCE from being scheduled or accepting duty periods that will exceed the maximum allowed instruction and evaluation time in any continuous 24-hour period (see GACAR §§ 142.57 and 142.61).

**NOTE:** For example, a TCE assigned to instruct 4 hours of flight training followed by a 3-hour simulator evaluation will be considered to have accumulated 7 hours of time toward the 8-hour maximum permitted by the applicable regulation.

3) The initial and annual instructor proficiency check must have been satisfactorily completed. The regulations require that each instructor must be checked annually "...in a representative segment of each curriculum (not aircraft type) for which that instructor is designated to instruct...."

4) The records must show the initial and annual evaluation of instructional ability. An instructor authorized to instruct in multiple curriculums must be evaluated and checked annually in each of those curriculums for which he is authorized to provide instruction. Each curriculum may be evaluated separately or concurrently with another curriculum if the PI determines that there is sufficient commonality between the curriculums to warrant crediting instruction in one as equivalent to the other. The records must document that the instructor has been evaluated for each of the assigned curriculums.

5) If the center will be providing contract instructors or contract check pilot to the operator, required instructor and TCE records will form the basis for qualifying those individuals as contract instructors and check pilot for the operator and will need to be available for review by the operator and its POI.

6) Prior to approving the center's record keeping system, the PI must review GACAR Part 142 regulatory requirements for qualification, training, testing, and checking and ensure the proposed method(s) of recordkeeping meets applicable regulatory requirements. The location of required records as well as the person responsible for their management must also be identified.

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### **4.9.6.15. CURRICULUM APPROVAL.**

**A. Requirements.** GACAR Part 142 requires training centers to obtain approval of a new curriculum or a revision to a currently approved curriculum before the subject curriculum may be conducted. Inherent in the approval process is the GACA's responsibility to deny approval of any training which does not meet regulatory requirements or which has been found deficient. Training curriculums that have been granted approval and later found to be in conflict with regulatory requirements or to be ineffective must be appropriately modified by the center, or GACA approval must be withdrawn.

**B. Obtaining Approval.** The PI should discuss with the training center the sequence and timing of events which occur in the development and the granting of initial and final approval of a training curriculum. If the center's proposal involves complex operations, the PI should consult the appropriate sections of this handbook and other relevant documents and also determine whether assistance from a GACA specialist will be necessary.

**C. Approval Process.** Training center curriculums are granted initial and final approval through the issuance of the appropriate paragraph(s) of the center's OpSpecs. PIs must not issue separate curriculum approval letters. The approval process follows a two step process: initial and final.

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#### **CHAPTER 10. PART 145 ADMINISTRATION**

##### **Section 1. Review/Approve a Part 145 Repair Station's Training Program**

###### **4.10.1.1. GAR ACTIVITY REPORT (GAR).**

- A. 3230 (AW) (Certification)
- B. 3396 (AW) (Approve Training Program)

**4.10.1.3. OBJECTIVE.** This section defines the terms and requirements for approval of a repair station's training program under the General Authority of Civil Aviation Regulation (GACAR) Part 145 by principal inspectors (PIs). It also explains various training procedures applicable to repair stations of varying size and complexity.

###### **4.10.1.5. DEFINITIONS.**

- A. Course.** A course is a set number of lectures, materials, or number of hours of study in a particular subject. For example, a course under the initial course of study for managers and supervisors may be “Repair Station Manual (RSM), Policies, and Procedures.”
- B. Course of Study.** A course of study, or curriculum, is a series of related separate courses in a subject area, such as the initial course of study for managers and supervisors.
- C. Course Outline.** A course outline, or syllabus, outlines the entire subject presented in an individual course. The course outline for the “Repair Station Manual, Policies, and Procedures” course may include the modules devoted to (1) The Repair Station Manual; (2) Repair Station Policies; and (3) Repair Station Procedures, with each module further broken down into subjects. For example, the “Procedure” module could include “Recordkeeping Procedures, Timekeeping Procedures, and Facility Security Procedures.”
- D. Course Module.** A course module is a set, logical, self-contained unit of a course. A course module may be given in one training session or lecture or spread over more sessions. Modules of the “Repair Station Manual, Policies, and Procedures” course may be (1) The Repair Station Manual; (2) Repair Station Policies; and (3) Repair Station Procedures.

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**E. Courseware.** Instructional material developed for each curriculum: Lesson plans, instructor guides, computer software programs, audiovisual programs, workbooks, aircraft or article technical manuals, and handouts. Courseware must accurately reflect curriculum requirements, be effectively organized, and properly integrated with instructional delivery methods.

**F. Employee Training Record.** The training record is the employee file in which all training is documented and retained for General Authority of Civil Aviation (GACA) review for a minimum of 2 years.

**G. Indoctrination.** Part of the initial training for all incoming personnel on general procedures that are unique to the repair station's operation, maintenance and inspection systems, and regulatory compliance requirements. Indoctrination or orientation establishes a common core of knowledge among employees.

**H. Initial Training.** Establishes new employee technical skill level and is adjustable based on an assessment of their training, experience, and relevant certificates held. However, whenever changes to repair station ratings; new tools and equipment; materials; and new methods, techniques, and practices are introduced to current employees as recurrent training, the initial training requirements for new employees should be updated and existing employees should be provided abbreviated initial training on the new information.

**I. Instructor.** An individual competent in the training methods, techniques, and practices; and familiar with the subject being taught.

**J. Recurrent Training.** Repetitive training at specific intervals to refresh employee knowledge of repair station policies, programs, and regulatory requirements. Alternatively, changes to repair station ratings; new tools and equipment; materials; and new methods, techniques, and practices may be imparted to existing employees through recurrent training.

**K. Task.** A piece of work to be done; an individual task that is part of the maintenance, preventive maintenance, and alterations required to return an article to service under the privileges of the repair station certificate and rating as assigned by appropriate management or supervisory personnel.

**L. Task Levels.** The areas defined in an articles technical data that comprise the division between maintenance, preventive maintenance, alterations, inspections, overhauls and other definitions,

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provide a clear indication of when a set of tasks is different from another set of tasks.

**M. Testing and Checking.** Methods for evaluating employees as they demonstrate a required level of knowledge in a subject, and when appropriate, apply the knowledge and skills learned in instructional situations to practical situations.

**N. Training Categories.** Training categories identify a distinct course of study such as indoctrination, initial, recurrent, remedial, and specialization training.

**O. Training Hours.** The total amount of time necessary to complete the training required by a curriculum segment. This must provide an opportunity for instruction, demonstration, practice, and testing, as appropriate.

**P. Training Methods.** Training methods identify how the training will be conducted and include formal classroom, computer-based, on-the-job, and embedded training.

**Q. Training Program Characteristics.** The training program characteristics are features of an overall good training program or good training program element, such as a needs assessment and program review.

**R. Training Program Elements.** An entire training program is made up of a number of different elements, such as the recordkeeping system, the initial course of study for managers and supervisors, or the recurrent course of study for PIs.

**S. Training Sources.** Training sources identify who conducts the training. Possible training sources are original equipment manufacturers (OEMs), Aviation Maintenance Technician Schools (AMTS), operators and other repair stations, and trade associations.

### 4.10.1.7. RESERVED.

### 4.10.1.9. BASIC FORMAT REQUIREMENTS.

**A. The purpose of the training program is for the repair station to:**

- Comply with the regulatory requirements of GACAR § 145.67
- Provide the training necessary for employees to perform their job functions efficiently,

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safely, and correctly

- Familiarize employees with the repair station's manual, quality systems, and procedures

**B. Training Program Documentation.** The RSM must include procedures required by the regulations for revising the training program. It must also include procedures for submitting those revisions to the GACA for approval.

**C. Language Requirements.** Repair stations must submit the repair station training program in English.

**D. Procedures.** The procedures should address how often the program will be reviewed to determine if it is current and adequate for the type of maintenance being performed at the facility. Because advancements in technology can cause aviation maintenance to change rapidly, a periodic review of training needs is appropriate. The procedures should include who will be responsible for planning recurrent training, and any new training that may be necessary. Repair stations that have established a management review program should include the training program for review during that meeting.

**E. The Principal Inspector (PI).** The PI must review the initial or revised procedures in the certificate holder or applicant's program submission. These should not be considered all-inclusive. Each facility is unique and may require additional procedures to verify regulatory requirements and the needs of the repair station. Procedures may address the following:

- Who in the repair station is responsible for submitting the initial training program and subsequent revisions to the GACA?
- When will the revisions be submitted?
- How will the revision be approved (include the company approval as well as GACA's)?
- How often will the repair station review training program currency and completeness?
- Who in the repair station will perform this review?
- How will the repair station record and implement revisions?

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- How will the revised text be identified and program materials updated?

### **4.10.1.11. PREPARATION.**

**A. Principal Inspector Responsibilities.** Each PI will need to become familiar with the operation of the repair station prior to reviewing and approving a repair station's training program submission. This is primarily due to the diversity in the certificate holder's size (physical and numbers of employees), ratings, capabilities, contract activities, and personnel experience and skill levels. The PI should consider all of these to determine if the certificate holder's training program meets the regulatory requirements in this chapter.

**B. Certificate Holder Responsibilities.** The certificate holder is responsible to ensure that the training program continuously reflects the repair station's capabilities and work its employees perform. Changes to any of the repair station's capabilities may constitute the need to revise the training program. Some of these capabilities include:

- Certificate ratings, privileges, and limitations
- Maintenance functions performed
- Personnel, position, ability, experience, and skill level
- Tools, equipment, and materials
- Procedures, methods, techniques, and practices
- Contractual arrangements with operators
- Contracting maintenance services
- Regulatory requirements
- Certificate holder's RSM and quality system requirements

NOTE: See Figure 4.10.1.1, Training Program Structure Guidelines for additional guidance on the outline and structure of a training program.

### **C. Training Program Structure.**

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1) *Repair Station Needs Assessment.* The repair station's needs assessment procedures enable the repair station to identify its training requirements based on job positions, duties, and tasks. It also establishes an objective method for determining training standards, assessing the capability of its employees, and establishing training programs for its employees to fill the gap between position/skill/task requirements and employee capabilities. Procedures associated with the repair station's needs assessment will be based on its size, employee hiring, assignment and training practices, customer bases, and the complexity of its ratings and scope of operations. The repair station should establish the basic standard that identifies the individual employee's training needs by assessing the job functions and duties against the employee's specific skills and knowledge. Training areas, programs, and lessons can then be assigned to fill any gaps between the skills and knowledge needed for the job tasks and the employee's capabilities.

a) The program description should include the processes the repair station will use to identify its training requirements for ensuring each individual assigned to perform maintenance (including inspection), preventive maintenance, and alterations tasks is capable of performing the job properly. The training needs assessment is a method of analyzing the job tasks associated with repair station's maintenance and alteration positions. This entails identifying the knowledge and skills required to successfully fill positions that perform maintenance and alteration tasks. In addition, when determining its training requirements, a repair station should analyze the nature of its business structure and its customers.

b) When identifying overall training needs, the repair station will consider:

- The tasks associated with each position responsible for performing maintenance, preventive maintenance, or alteration
- The skills, experience, and training of new and current employees
- How assessments will be made of employees being assigned new tasks
- The return of an employee to tasks after an extended period
- The introduction of new regulations, procedures, equipment, or recordkeeping requirements

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- Change in the nature of basic repair station capability
- c) The needs assessment reviews the repair station's training requirements in the context of its existing staff's capability and tasks associated with specific work assignments. Based on the outcome of its training needs assessment, the repair station can develop and revise its areas of study and/or courses. The training needs assessment should identify the requirements for initial and recurrent training. Based on its needs assessment, the repair station will determine the type and extent of training needs for the company and for individual employees.

### 2) *Employee Needs Assessment.*

- a) The repair station's procedure should evaluate the current capability of its repair station employees, both technical and nontechnical. Only those performing maintenance or alteration tasks must be trained under GACAR Part 145; however, the repair station may wish to include employees that support or manage technical personnel. The training program should differentiate between those employees required to be trained under the program and those that will be trained in accordance with the procedures at the repair station's discretion. Once a technical employee's capabilities have been assessed, employee specific training needs will be identified.
- b) When carrying out any assessment of an individual's capabilities, the repair station's process should be as objective as possible and structured to produce consistent results. The repair station should establish the standard skill level and qualifications for assigned tasks under the job function or position, then establish objective methods for comparing an individual's capability to those standards. It may be necessary for the repair station to use more than one method to adequately assess an individual's capability. The repair station should also have procedures to accept prior experience, training, or education to establish an individual's capability. The repair station should also have procedures to ensure the following:
  - The assessment is objective based and consistent
  - The assessment is documented in the individual's training records
  - The individual conducting the assessment is qualified to evaluate the results of

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the assessment

- The individual is capable of performing the tasks consistently at an acceptable level and assigning necessary initial, recurrent, or remedial training

3) *Indoctrination.* Indoctrination training should consist of the repair station's specific operations and procedures. This is core training for all repair station personnel. The scope and depth of indoctrination training may vary based on the individual's assigned position. However, indoctrination training should be similar for all employees to establish a standard core of knowledge. The repair station should determine the level of indoctrination training required for each job assignment, through its training needs assessment process. The following subjects should be addressed in the training program, regardless of the repair station's size or ratings:

- a) GACAR requirements, particularly those associated with the repair station maintenance functions and authority as reflected on the certificate and operations specifications.
- b) Company manuals, policies, procedures, and practices, including quality control processes, particularly those associated with ensuring compliance with maintenance (including inspection), preventive maintenance, and alteration procedures established to show compliance with GACAR Part 145.
- c) Maintenance human factors (which included human performance).

**NOTE:** Training in maintenance human factors is an essential part of a GACA-approved training program. The repair station's submitted training program and any revision thereto must include human factors elements. The GACA will not prescribe what human factors elements to include, but those elements should focus on aviation maintenance, and safety related issues.

- d) Computer systems and software, as applicable to the repair station's maintenance (including inspection), preventive maintenance, and alteration systems and procedures.

**NOTE:** Regardless of the experience level of incoming personnel, indoctrination on procedures unique to the repair station should ensure a smooth transition into the work environment. The repair station should schedule this phase of training within a reasonable

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time after hire to ensure the employee understands the repair station's operations.

4) *Initial Training.* This training should consist of all the technical subject areas and be consistent with the specific employee's position and assigned job activities.

- a) The repair station's technical training areas of study may be separate and distinct from indoctrination training and may apply to different categories of employees within a given job position. Technical training requirements should focus on providing employees with the appropriate skill or task training required to properly perform job position assignments.
- b) The repair station should have procedures to determine the applicable scope and depth of initial and/or recurrent training based on each job assignment and each employee's experience and capability established by the needs assessment. The needs assessment is the basis for determining an individual's initial and recurrent training requirements.
- c) When developing the initial or recurrent training courses, the repair station may want to take into account that individuals will not have the same training, experience, and skill level. For example, when developing its initial course of study for technicians, a repair station may want to have separate programs for:
  - Individuals that hold a mechanic certificate
  - Individuals with experience performing similar tasks at another repair station
  - Individuals with applicable military aviation maintenance experience
  - Individuals with no skills, experience, or knowledge
- d) A repair station may have more than one training course for its employees. For example, initial training for new repair station technicians with limited repair station experience may include the following in depth courses:
  - Maintenance human factors
  - Tools

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- Test equipment, including ground support equipment
  - Materials and parts
  - Records and recordkeeping
  - Shop safety
  - Specific job or task training
- e) In contrast, initial training for new technicians with prior repair station experience may include a general review of the same subjects as necessary and detailed technical training only for specific job or task assignments. In all events, an individual's specific training requirements should be established based on a needs assessment.
- f) The time devoted to initial or recurrent training can vary depending on the level of experience of the individual and skills and knowledge associated with the assigned job or tasks. However, the repair station should establish a basic minimum standard for all employees in a specific job position, whether through training given by the repair station or knowledge acquired through other sources.
- 5) *Recurrent Training.* This training program element should provide procedures for recurrent training of subject areas relevant to a repair station employee's job function in order for them to remain current within their assigned job activities.
- 6) *Specialized Training.* The repair station should have procedures to identify job assignments that will require special skills or have complexity that would require the development of specialized training to ensure capabilities. Some areas that may require specialized training include flame and/or plasma spray operations, special inspection or test techniques, special machining operations, complex welding operations, aircraft inspection techniques, or complex assembly operations.
- 7) *Remedial Training.*
- a) A repair station should have procedures to determine an individual's training requirements, including when an employee will be provided remedial training.

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b) Successful remedial training should show an individual what happened, why it happened, and how to prevent it from happening again in a positive manner. Remedial training may be included in the repair station's definitions of initial or recurrent training requirements.

8) *Training Documenting.* Training program documentation should be tailored to the repair station's size and job assignments, complexity of capabilities and maintenance functions.

a) The repair station must document, in a format acceptable to the GACA, the individual employee training records set forth in the manual approved by GACA under GACAR § 145.67(a). The capability of each employee depends on training, knowledge, and experience. Consequently, the determination by the repair station that an employee is able to perform the maintenance, preventive maintenance, or alteration assignment requires an analysis of the factors that contribute to the employee's capability.

b) The repair station may retain its training records electronically or in hard copy. In either case, the repair station should standardize the format and content for the training records based on individual job assignments. However, each employee's records should contain at least:

1. The employee's name and job position.
2. Training requirements as determined by the needs assessment, including requirements for indoctrination, initial, and other training required by areas and course titles.
3. GACA certificates applicable to the qualifications. For example, supervisors, RII personnel and persons approving articles for return to service must be certificated under GACAR Part 66.
4. Other certifications, diplomas, and degrees.
5. Authorizations and qualifications (if not covered by GACAR Part 66 certificates).
6. List of accomplished training, to include enough information to determine whether it is applicable to the employee's capability to perform assigned tasks:

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- Course title or description
- Course objective
- Date completed
- Test results
- Total hours of training
- Location of training
- Name of instructor and/or instructor qualifications
- Signature of employee

7. Other documentation relevant to determining capability to perform tasks associated with assigned duties, such as past employment, knowledge, oral and practical tests results, etc.

c) All records that are required by the training program to determine whether an employee is capable of performing assigned tasks as well as those that document training conducted by the repair station should be considered those required by GACAR § 145.67(a).

**D. Measurement of Capability.** The training program should have methods to identify current levels of capability and methods for monitoring and managing capability. GACAR § 145.67 requires that “the training program must ensure each employee assigned to perform maintenance, preventive maintenance or alterations, and inspection functions is capable of performing the assigned task.” Organizations should have a mechanism for determining capability of employees for all areas (both technical and non technical) in which an employee is required to be competent.

1) *Examination.* A good mechanism for assessing knowledge, but not necessarily capability of applying knowledge in a work context.

2) *Interview.*

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3) *Qualifications.* A good source of evidence, if the training course or other method used to gain the qualification are directly relevant and practical for application in the workplace.

4) *Completion of Training Courses.* A good way of providing information, but not sufficient to prove individual capability in applying the knowledge gained from the course.

5) *On the Job Assessment.* A good way of determining capability, however its effectiveness relies heavily on the competence of the supervisor or manager conducting the assessment as it relies on their subjective judgment.

6) *Human Factors Assessments.* Employees are asked what they would take into account when doing particular tasks. As an example, a planner explains knowledge of maintenance human factors: he would consider the effect fatigue might have and schedule critical tasks to be completed during the day shift or at the start of the night shift rather than in the early hours of the morning. This explanation shows the planner understands how some maintenance human factors issues are applicable to his job. Documentation of the assessment process should include:

- a) Establish objective levels of capability (apprentice, journeymen, inspector, RII inspector, instructor, supervisor, etc.).
- b) Establish levels of capability based on the specific job function of the employee and identify the task level to which that employee is able to perform.
- c) Monitor and manage capability through documentation of the performance level of the employee:
  - Method of ensuring that the employee understands the application of maintenance, preventive maintenance, or alterations and the repair station's performance issues appropriate to that person's function in the organization
  - Recording of the capability of the employee to consistently repeat the performance of a task at an acceptable level
  - Audit of tasks performed
  - Method for identifying and correcting deficiencies

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**NOTE:** See Figure 4.10.1.2, Inspector Evaluation Guide for the Development and Implementation of a Part 145 Repair Station's Training Program for additional guidance.

**4.10.1.13. ISSUES AFFECTING PROGRAM REQUIREMENTS.** The following issues vary by repair station and may affect the construction of its training content.

**A. Added Requirements.** Maintenance performed for GACAR Part 121, 125, 133, 135 and for foreign operators adds requirements to the repair station training program, which must be documented. Repair station procedures should describe a plan for ensuring that training is conducted on the operator's program for the maintenance functions to be contracted prior to the facility performing maintenance, preventive maintenance, or alterations for the specific operator. Documentation and recording of the specific training is the responsibility of both the operator and the repair station. Documented training should show specifically that the repair station was trained in accordance with the operator's program and applicable section of its maintenance manual.

**B. Foreign Repair Stations.** The significant difference between domestic and foreign repair station personnel is that foreign repair station personnel are not required to be certificated under GACAR Part 66. Equivalent personnel positions must have the same level of training as specified for their domestic counterparts. This training would include those subject areas as discussed in this chapter.

**C. Foreign Repair Stations.** Repair stations that hold approval under Federal Aviation Administration (FAA), European Aviation Safety Agency (EASA), Transport Canada and other foreign Civil Aviation Authorities, may already have a training program that complies with GACAR Part 145 requirements. PIs should perform a careful review of this program to ensure that the applicable regulatory requirements of GACAR § 145.67 are met. Upon review by the PI to ensure that the training program contains all the required elements, the PI may then approve the program. The training program now becomes the repair station's GACA approved training program.

## 4.10.1.15. TRAINING METHODS AND SOURCES.

**A. Methods.** There are many methods available to formulate a good training programs as well as actually delivering training. Certain training methods are more appropriate than others are for

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teaching specific types of skill and knowledge. Training methods can be classified into one of the following categories:

1) *Classroom Training*. A training course is normally defined as one that is usually taught by a manufacturer or other aviation agency/operator, or the repair station if instructor training personnel are trained and subject matter experienced. A valuable asset of this type of training is the interaction between course instructors and attendees, where views and experiences are compared. The importance of a skilled and knowledgeable trainer cannot be overestimated. Much of the emphasis of training should be upon reinforcing or changing attitudes and imparting knowledge; and a good trainer/facilitator is the key. This is normally considered in classroom/formal training where the quality of the training relies heavily on the instructor's ability and the adequacy of the classroom environment.

2) *On-the-Job Training (OJT)*. OJT encompasses the basic principle of learning while accomplishing a task or work. Normally this consists of demonstrations and supervised practice with equipment and procedures in the actual work environment. It can be an effective method of imparting skills to employees, and may be most effective when:

- Employees already have prerequisite knowledge and skills and do not need long explanation and discussions
- The target skills can only be taught, or are best learned, in an actual work environment
- The work environment cannot be reasonably simulated or replicated in the classroom or with computer based training (CBT)
- The training task closely matches tasks found in the repair station, such as accomplishing steps in a procedure
- Training program documents appropriate curriculum and syllabuses
- Training program documents a method to ensure that OJT instruction personnel are qualified and experienced in giving training

3) *Computer Based Training (CBT)*. CBT, or Internet based training, is a generic term that refers to any electronically based technology that is used to create and deliver training. Most products include built in testing, participant management, administration, and

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recordkeeping functions. There are wide varieties of hardware and software applications that can be used or tailored to a particular repair station's needs.

- a) The primary advantages are an interactive method of training, intelligent tutoring systems, and the capacity of material to be adapted to individual employee needs with testing that conforms to a level of knowledge, skill, and pace. It permits the material presentation and testing to be standardized. It is also good for enhancing skills that require practice, such as troubleshooting and computational skills, or memorization of facts such as specifications. Use of CBT prior to attending a course/class can help ensure that an employee masters the basic prerequisite knowledge needed for the class.
- b) Repair stations should assess whether or not the particular category of a training program can be completed by use of CBT alone or by adding practical skill level training and testing to ensure the appropriate capability level of the employee.

### 4) *Just in Time/Embedded Training.*

- a) This permits users to learn specific job tasks just before they need to accomplish it, or during the accomplishment of the task itself. This method of training is also called "embedded" training because it can be incorporated into the equipment or software that is used to perform the job in question. This type of training may encompass interactive instruction or application and require observation by an instructor or supervisor.
- b) Embedded training can also appear in software applications and operating systems as sophisticated contextual "help" programs or tutorials. The application itself becomes the instructor. In this case, there is not usually a method to ensure that the employee can perform the specified task to an appropriate level. This means that the training program must contain a method to ensure the designated knowledge and skill level is obtained by the employee. Embedded training is most appropriate under the following conditions:
  - Employees cannot be novices, and must have some knowledge of the topic or task
  - The task to be learned is clearly identified in scope and conceptually simple
  - The media and method in which training is embedded are Part of the task or equipment to be learned

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- A clear record of the employee testing and assessment must be contained in the repair station's program

**B. Sources.** A repair station may adopt several training sources in the development of its training program. A combination of sources, methods, and the training needs assessment may be used by the repair station. Each source also has advantages and disadvantages depending on the repair station's training needs and size. Training sources can be classified into one of the following categories:

1) *Original Equipment Manufacturer (OEM)*. An OEM usually provides both formal and informal types of courses depending on complexity of subject matter. However, there are usually prerequisites that the employee must meet prior to attending OEM courses, such as previous mechanical/electronic background and experience. OEMs that have training departments normally also have the records showing the qualifications of their instructors. Instructor qualifications must be made available to the repair station prior to using the OEM services for training. Most OEM training is either a specific system, or article or product of a system, and may not cover the interactivity of system or article to a product.

2) *Aviation Maintenance Technician Schools (AMTS)*. AMTS certificated under GACAR Part 147 can be a great source of training for repair stations. They have certified and qualified instructors, approved curriculum, syllabus, and course material, and necessary equipment to provide hands on skills training. While this is an excellent source of training, repair stations may need to supplement this training with their own indoctrination, initial, and recurrent training along with article and/or product training to a specific level. The repair station's training program should describe the use of this type of source and have a method (assessment) to determine what is most suitable for it and its personnel, when it plans to use an AMTS.

3) *Other Repair Stations*. Large GACAR Part 145 repair stations, especially those that perform work for an operator, may be an excellent source to provide training to smaller repair stations. Smaller repair stations may contract with these facilities for technical training as it pertains to its ratings and operations specifications or maintenance human factors training. The utilization of this type of training may provide a cost savings to a smaller entity.

4) *Other Sources*. There are a variety of other training sources, which include, but are not limited to, independent seminars, product demonstrations, computer based instructions,

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videos, and equipment manufacturers. All sources of information should be viewed as potential training sources. The repair station's training program should have a method of incorporating training opportunities to ensure each employee is capable of performing assigned tasks.

5) A combination or all of these methods and sources may be appropriate to any given repair station.

**C. Coordination Requirements.** These tasks require coordination between the repair station and the PI.

### **4.10.1.17. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References.**

- GACAR Part 39, 43, 66, 91, 121, 125, 133, 135 and 145
- FAA AC 145 10 (as amended), Repair Station Training Program
- FAA AC 145 99 as amended), Guide for Developing and Evaluating Repair Station and Quality Control Manuals

#### **B. Forms. GAR.**

#### **C. Job Aids. None.**

### **4.10.1.19. ELECTRONIC MEDIA.**

**A.** Repair stations that elect to use electronic media (e.g. CD ROM or Internet based systems) must be allowed to use those systems without interference or extra procedures. It is incumbent upon the certificate holder to ensure its offices are equipped for the media it selects to ensure delays or other hindrances do not occur. To ensure a consistent approach to document and manual submissions and revisions, the requirement for signing the title page or revision page will be replaced by transmittal documents.

**B.** Use of electronic transmissions, e.g., e mail or fax responses, are an acceptable alternative to the cover letter if the repair station is equipped to transmit and receive any necessary

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attachments. This may include the use of electronic signatures. This method should be addressed in the repair station's procedures and be found acceptable to the GACA.

### **4.10.1.21. EVALUATION AND APPROVAL OF A TRAINING PROGRAM AND REVISIONS.**

**A. Overview of the Process.** Training program approval is predicated upon the repair station's ability to comply with the requirements to GACAR Part 145, which is based on a repair station's specific capabilities. Depending on the complexity of the repair station's request and the availability of GACA resources, the approval process may be accomplished in only a few days, or the process may last a few months. Once GACA approves the repair station training program the repair station will begin to follow their approved procedure. The approval process applies to each repair station requesting approval of a new program or a revision to a currently approved program. Training programs submitted to the GACA for approval and found to be in conflict with regulatory requirements or inadequate, must be appropriately modified by the repair station in accordance with established procedures of the repair station manual. When appropriate, job aids have been developed to assist inspectors in the approval process.

### **B. Procedures for Obtaining Training Program Approval.**

1) The procedures for obtaining the training program approval normally begin with a meeting between the responsible training personnel of the repair station and the PI to discuss the scope of the training, the timing of the program document submittal, and other plans. This meeting will be an opportunity for the repair station to ask questions about the GACA process. Although this meeting is not required, it will provide an opportunity for both sides to understand the expectations of the other on a subject that is new to both. For a new repair station, this initial meeting is also an opportunity for the GACA to verify the intent of a new repair station with respect to:

- Ratings and other authorizations that will be sought
- Maintenance function that will be contracted
- Customers that include GACAR Part 121, 125, 133 and 135 operators
- Personnel current and required capabilities
- Tools, equipment, and facilities

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- Overview of procedures and paperwork
  - Proposed training and training sources
- 2) The formal submittal of the training program should be made on or before the dates as defined in GACAR Part 145.
- 3) The repair station may submit its program document as electronic media; however, it is the repair station's responsibility to ensure GACA is equipped to review and store the submitted material in the media the repair station selects. Material submitted electronically must be accompanied by a transmittal document. GACA approval will be similarly indicated by a transmittal document. These transmittal documents may be in the form of an e mail, fax, or letter and may include the use of electronic signatures. As required by GACAR § 145.89(e), the repair station's manual must contain a description of the procedure it will use to submit changes to the training program. Similar procedures should be used to submit the program for initial approval. The repair station manager or someone acting on his behalf must sign the submittal.
- 4) The content of the initial training program submittal may be reviewed using the criteria and standards described in FAA AC 145 10 (as amended).
- 5) GACA will review the proposed training program or revision and either approve it or prepare an explanation of why the program or revision cannot be approved as submitted. A letter or electronic transmittal of the GACA approval or rejection will be sent to the individual who has signed the submittal for the repair station.
- 6) If GACA is not able to approve a submittal, the repair station should propose revisions that address GACA's concerns. When the repair station has adequately addressed all the concerns expressed in the rejection, the program will be approved.
- 7) A change to the approved training program can be initiated by the repair station or by input from the PI. Any revision to the program document should be provided to the PI for approval. The training program will be changing constantly, as it should, to accommodate changes to the repair station's work and/or customers, and in response to the ongoing assessment processes of the repair station and of the GACA. Correction of typographical errors and changes to phone numbers would be examples of changes not needing GACA approval. However, the repair station should send a corrected copy to the GACA.
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- 8) The GACA does not determine instructor qualifications. However, if the GACA through its surveillance process finds that the qualifications or skills of an instructor are deficient, the repair station must correct any deficiency associated with that instructor and with its instructor selection and quality monitoring process.
- 9) The training program must have a process measurement element that verifies the effectiveness of the training. This provides a continuous improvement characteristic to the training program. Therefore, one of the key areas the GACA will monitor is the feedback process that takes evaluation results and adjusts training needs. The GACA might also independently assess training to evaluate the effectiveness, particularly where safety risk is relatively high.
- 10) Training standards are not set by the GACA but the PI should verify that the repair station has an adequate training program to meet regulatory requirements. If, in the course of normal surveillance or in the investigation of an unplanned and undesirable event, a GACA aviation safety inspector (Inspector) discovers inadequate training, he will notify the repair station that a training deficiency has been identified and that a change must be made. The GACA will give the repair station a reasonable time to make the change as long as steps are taken by the repair station to ensure no un-airworthy product results from the training deficiency. When the repair station develops a modification to the training program to correct the deficiency, the PI will review it and either approve the revised program or indicate that additional changes are still required.
- 11) If the program or program revision is submitted in an electronic format, the PI will indicate approval or denial with an e mail message or letter. If approval of the submittal is denied, the GACA e mail message or letter will include an explanation of the denial.
- 12) The training program revision process may be initiated by either the repair station or the GACA as follows:
  - a) Repair Station Initiated. The operator informs the GACA that it is planning to establish a new training program element/component or to change an existing program.
  - b) GACA Initiated. The GACA informs an operator that revisions to its training program are required based on recently acquired information relative to training techniques, aviation technology, aircraft maintenance history, or regulatory changes.

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**C. Evaluating Training Program.** The Training Program must be evaluated to determine that a repair station's training program contains the elements necessary to sustain the repair station capabilities.

- 1) At a repair station to which more than one discipline of Inspector is assigned, Inspectors should work together during the review and approval of the training program. Even a repair station assigned only one PI may benefit from a peer review using their expertise to ensure that programs are in accordance with the regulations.
- 2) The evaluation begins when the repair station starts training under the approved training program. The PI should monitor training conducted under program approval. Whenever possible, the first session of training conducted should be monitored by the PI or a qualified Inspector. An Inspector does not need to observe every training session. A sufficient sampling of the training sessions, however, should be observed as a basis for a realistic evaluation.
- 3) During the evaluation, the repair station must demonstrate the ability to effectively train their personnel. Any deficiency identified during the evaluation of the training program must be discussed with the repair station. The repair station will make the necessary changes to correct the deficiency to its training program.

**D. Elements Available for Evaluating Training.** The PI must develop a plan for systematically evaluating training given under the approved training program. There are five elements, which can be evaluated when assessing the overall effectiveness of training programs. These five elements are: course outlines, courseware, training methods and training environment, testing and checking, and surveillance and investigation of repair station activities. These elements are interrelated; however, each can be separately evaluated.

- 1) Before evaluating a training program, an Inspector must become familiar with the contents of the training courses to be evaluated. This preparation is essential if an Inspector is to determine if a repair station has developed an effective course of instruction.
- 2) Direct examination of courseware includes reviewing materials such as lesson plans, workbooks, etc. Courseware is usually the training program element which is most adaptable to revision or refinement. Inspectors must review at least a sampling of the courseware.

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3) Direct observation of instructional delivery includes surveillance of training methods, such as instructor lectures, CBT presentations, and OJT instruction. Effective learning can only occur when an instructor is organized, prepared, and properly uses the courseware and various training aids. The Inspector must determine if the instructional delivery is consistent with the courseware. For example, the Inspector should note if the instructor teaches the topics specified in the lesson plan. Training aids and devices should function as intended during the instructional delivery. In addition, during training, the Inspector should be sensitive to the type of questions being asked by employees and should identify the reasons for any excessive repetition. These conditions may indicate ineffective training method or courseware. The Inspector must also determine if the instructional environment is conducive to learning. Distractions which adversely affect delivery, such as excessive temperatures, extraneous noises, poor lighting, and cramped classrooms or workspaces, are deficiencies because they interfere with learning.

4) Direct observation of testing and checking is an effective method for determining whether learning has occurred. Examining the results of tests, such as oral or written tests, or OJT, provides a quantifiable method for measuring training effectiveness. The PI must examine and determine the causal factors of significant failure trends.

5) Direct observation of training and checking in progress is an effective method of evaluating training. Sometimes the opportunity for direct observation, however, will be limited. In such cases, the PI will have to rely more on his evaluation of other sources of information such as reports of surveillance and investigations. Results of inspection reports, incident or accident reports, enforcement actions, and other relevant information about the repair stations should be evaluated by the PI for training effectiveness. For example, repeated reports of deficiencies, such as inability to grasp troubleshooting techniques or incorrect use of technical data or RSM procedures, may be traceable to a lack of specific training or ineffective training. Such information may provide indications that revisions or refinements are needed for a training course and/or training course modules.

### **4.10.1.23. TASK OUTCOMES.**

#### **A. Complete the GAR.**

#### **B. Complete the Task.** Completion of this task will result in one of the following actions:

- 1) Approval of the training program/revision by doing the following:
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- a) Place “Approved,” with date, and signature of inspector on the list of effective pages.
  - b) File copies of training program/revision as follows:
    - If an original training program, file a copy of the entire training program in the certificate holder’s file
    - If a revision, remove affected pages, insert revised pages in current training program, and update the manual control document
  - c) Return the training program/revision to the applicant with a letter.
- 2) Reject the training program/revision by doing the following:
- Return all copies to the applicant with letter explaining discrepancies
  - Explain to the applicant that the manual must be corrected and resubmitted in order to proceed with the certification or revision process, and file all supporting paperwork in the certificate holder’s file

**4.10.1.25. FUTURE ACTIVITIES.** Perform follow-up and surveillance inspections as required. This section is not all inclusive; repair station size and capabilities may determine which elements are applicable.

### Figure 4.10.1.1. Training Program Structure Guidelines

**A. Training Course Outline.** The repair station as appropriate can determine its training requirements. Each course/course module should include the following information:

- 1) *Course Prerequisites.* What employees must have completed before they are eligible for the course.
- 2) *Training Subject.* What knowledge is to be imparted by the course and the course content.
- 3) *Course Duration.* May be specified in hours.

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4) *Training Methods.* The method for the training course should be specified. There are varieties of methods to choose from based on what is most appropriate for the course in question. They range from OJT to formal classroom courses.

5) *Completion Standards.* There should be a description of what has to be accomplished for the employee to complete the course/syllabus. Examples of this could be a knowledge or practical test with a passing grade, a submitted project or demonstration of skill, or a certificate of completion.

**B. Qualifications and Authorizations.** The repair station should describe the training requirements for various qualification levels of its employees depending on their job function as well as individual authorizations. For example:

- RII (if applicable)
- Inspector levels
- Technician skill levels
- Specialized services

**C. Instructor Selection.** The repair stations training program should include criteria for instructors and a description of how instructors are selected. In cases where the sources of training are external to the repair station, it may not be possible to select instructors, but the quality of instruction should be monitored to ensure the quality of training employees receive is adequate.

**D. Planning and Scheduling.** Most training should be scheduled in advance to ensure adequate preparation time and to maintain a continuity of training for all employees. Management should plan training based on current requirements, but the plan should be adaptable to changing needs, such as those of a new customer or with the acquisition of new equipment. Occasionally, remedial training will be required for employees stemming from the results of an audit, or unacceptable skill demonstration. This type of training cannot be scheduled in advance and may have to be accomplished relatively quickly. Therefore, the training schedule should be sufficiently flexible to accommodate such circumstances.

**E. Training Records.** The repair station's training program should specify where employee

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training records are maintained and for how long (at least 2 years). Many repair stations will elect to keep employee training record summaries in a computer system. If records are maintained electronically, the repair station should also maintain a physical file to keep important documents such as GACA certificates, diplomas, and proofs of course completions. The training program should also specify the procedures by which records are maintained as well as what quality control will be conducted over those records. At a minimum the training record should include:

- Employee's name and signature
- Dates and duration of training
- Type of training
- Location of training
- Name and signature of instructor
- Test results (if applicable)

**F. Training Facility.** A description of the repair station training facility/facilities may be included in the repair station's training program. If the facility has a dedicated classroom, it should be adequately lighted, ventilated, and equipped. Alternatively, an off site facility could be used, or the facility may be the repair station's work area.

### **G. Quality Control.**

- 1) Each repair station should discuss in their training program how they intend to monitor the quality of the training they provide to their employees. There should be a formalized effort to review the effectiveness of the training program, although this may be through an external means (such as an audit accomplished by a department other than training). At the very least, employees should be asked to fill out course evaluation forms. These should be compiled and analyzed to identify either best practices or deficiencies in instructors or training materials.
- 2) Supervisors may also elect to attend certain classes to enhance the quality control process, although this may not be easy for classes provided by external organizations.

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Audits of external training providers may be scheduled as an alternative. If this is not possible or desirable, some interviewing of returning course attendees can be accomplished to obtain more detailed information than would be possible through a written questionnaire.

**H. Definitions and Abbreviations.** The repair station training program should define all terms and acronyms for the sake of clarity and to avoid confusion in cases where acronyms are company specific and may have different meanings among different facilities.

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### **Figure 4.10.1.2. Inspector Evaluation Guide for the Development and Implementation of a Part 145 Repair Station's Training Program**

The training program development process should include:

- A. Needs Assessment/Analysis.** The purpose of this phase is to determine the goals and objectives of the training.
- B. Design Phase.** This phase serves to refine training goals and objectives and instructional and evaluation strategies.
- C. Course of Study.** The course categories can be organized into a course outline, specific course, or course modules.
- D. Prototype.** This phase includes the delivery of training materials, the training of instructors, and a dry run of the sections in the program to verify proper flow of the material.
- E. Validation.** At this stage the training can be delivered in a typical training environment. Meetings should be held to discuss and evaluate the prototype to fine tune the program.
- F. Adoption.** The training program is scheduled and formally announced.
- G. Implementation.** The training is provided at this stage.
- H. Employee Evaluation.** It is important to evaluate the employee's comprehension of all course material.
- I. Program Measurement.** Program developers should identify valid and reliable processes to measure training program effectiveness.
- J. Feedback.** This phase allows the product to influence the training program in a constant cycle of evaluation and improvement, such as through class and/or instructor evaluations.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 10. PART 145 ADMINISTRATION**

##### **Section 2. Evaluate Repair Station Manual and Quality Control Manual or Revision for Part 145**

###### **4.10.2.1. GACA ACTIVITY REPORT (GAR).**

- A. 3230 (AW) (Certification)
- B. 3371 (AW) (Manual Initial)
- C. 3372 (AW) Manual Revision

**4.10.2.3. OBJECTIVE.** This section provides guidance for evaluating General Authority of Civil Aviation Regulations (GACAR) Part 145 Repair Station Manual (RSM) and/or Quality Control Manual (QCM) original submissions or revisions.

**NOTE:** This guidance should be used in conjunction with Volume 3, Chapter 11, The Certification Process for Part 145, when certificating a new repair station.

###### **4.10.2.5. GENERAL.**

**A. Currency of a Manual.** The certificate holder's RSM and/or QCM must reflect the applicant's current procedures and be acceptable to the General Authority of Civil Aviation (GACA).

**B. Revision of an Existing Manual.** When a certificate holder revises an existing manual, the GACA must also accept the revisions.

**C. Manual Content.** The manuals submitted by a certificate holder or applicant may be separate or may be combined into a single manual. The format should be consistent and all regulatory requirements must be included. The principal inspector (PI) must ensure the procedures used in the performance of maintenance, preventive maintenance, or alterations are reflected accurately in the manuals. It is expected that, to fully describe the repair station's inspection/quality system, there will be some procedures that may not be regulatory.

**D. Original Certification versus Revision.** When evaluating a manual as part of an original

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certification, each entire manual will be submitted prior to certification. If this task is performed as a revision, only the portion of the manual that is revised must be submitted.

**E. RSM and QCM.** Each certificated repair station must maintain a current RSM and QCM.

**F. Accessibility of Manual.** A certificated repair station's current RSM/QCM must be accessible for use by repair station personnel. All repair station employees on all shifts must have access to the manual, regardless of the media used (electronic, CD ROM, etc.).

**G. Repair Station Requirements for GACA.** A certificated repair station must provide GACA the current RSM/QCM in a format acceptable to the GACA. If the manuals or manual submitted are in electronic media format, they must be compatible with GACA electronic capabilities and free of any programs that would adversely affect that capability.

**H. Recommendations for Manual Development.** There are some recommendations included in this handbook referenced from Federal Aviation Administration (FAA) Advisory Circular (AC) 145 9 (as amended), Guide for Developing and Evaluating Repair Station and Quality Control Manuals, which are not required by the regulations. They have been included to assist the PI and certificate holder in developing a more complete description of the repair station's overall functions, responsibilities, and quality control procedures.

**I. Maintenance and Alterations in Accordance With Operator's Manuals .** For certificate holders under GACAR Part 121 and 135, maintenance, preventive maintenance, and alterations must be performed in accordance with applicable sections of that operator's manuals.

**4.10.2.7. PREREQUISITES AND COORDINATION REQUIREMENTS.** This task will require coordination between the PI and the certificate holder.

**4.10.2.9. REFERENCES, FORMS, AND JOB AIDS.**

**A. References:**

- GACAR Parts 1, 39, 43, 66, 91, 121, 125, 133, 135 and 145
- FAA AC 145 9 (as amended), Guide for Developing and Evaluating Repair Station and Quality Control Manuals

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**B. Forms.** GAR.

**C. Job Aids.** None.

### **4.10.2.11. RSM PROCEDURES.**

**A. Acceptable Format.** Receive the certificate holder's manual or revision as required by GACAR §§ 145.15(a)(1) and (2), 145.87, and 145.91(c).

**B. Manual or Revision Content.** Review the submitted manual or revision to ensure that it meets the regulatory requirements of GACAR §§ 145.89 and 145.91. The manual or revision must include the following:

1) An organizational chart that identifies:

a) Each management position with authority to act on behalf of the repair station.

1. The organizational chart required by GACAR § 145.89(a) may identify management positions and their area of responsibility as well as their duties and responsibilities.

2. Management includes, but is not limited to, the executive functions of planning, organizing, coordinating, directing, controlling, and supervising.

3. This does not eliminate the requirement in GACAR § 145.15 for an applicant to submit the names and titles of its management and supervisory personnel at the time of application.

b) The area of responsibility assigned to each management position, which is the area(s) in the repair station that the manager is directly accountable for and maintains decision authority over.

c) The duties, responsibilities, and authority of each management position.

2) Procedures for maintaining and revising the rosters required by GACAR § 145.65.

**NOTE:** Within 5 business days of the revision, the rosters required by this section

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must reflect changes caused by termination, reassignment, change in duties, scope of assignment, or addition of personnel.

3) A description of a repair station's operations describing how the maintenance is to be performed, where it would start, and how it progresses through the entire repair cycle for approval for return to service. Also include:

- a) A description of the housing may include dimensions, construction method, heating and ventilation systems, lighting, door openings, and physical address.
- b) A description of the facilities describing how the shop, hangar, or other work areas are laid out.
- c) A description of the equipment, tooling, and materials used to perform maintenance.

**NOTE:** The “description of materials used to perform maintenance” should not be a physical description of the material, but rather an explanation of the repair station’s handling and storage of the materials. If materials require specific environmental controls or cannot be stored next to certain chemicals or solvents, these should be identified. For example, it would not be acceptable to store oxygen equipment near petroleum products.

1. If the repair station does not own the equipment, procedures must be included in the manual that describe how the equipment will be obtained (lease, rentals, etc.).

The manual must also include where the equipment will be used, how personnel will be trained to use the equipment, and how the repair station will ensure calibration issues, if any, are addressed after transporting the equipment.

2. If the repair station chooses to use equipment, tools, or materials other than those recommended by the manufacturer, the manual must include a procedure used by the repair station to determine the equivalency of that equipment, tool, or material.

**NOTE:** When the repair station is adding a rating, or an applicant has applied for certification, all required equipment for the rating it seeks must be in place for inspection by GACA. This provides the PI with the opportunity to evaluate its placement and use and to verify that repair station personnel are trained to operate it.

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4) Capability list procedures used to:

- a) Revise the capability list provided in GACAR § 145.97 and notify the GACA of revisions to the list, including how often GACA will be notified of revisions; and
- b) Develop and perform the self evaluation required by GACAR § 145.97(c) for revising the capability list, including the methods and frequency of such evaluations and procedures for reporting the results to the appropriate manager for review and action.

5) Procedures for revising the training program and submitting revisions to the GACA for approval, which should include:

- The title of the person authorized to make a training program revision
- The method of submitting a revision (electronic, hard copy, disk, etc.)
- A procedure for recording a revision and a method of identifying the revised material or text

6) Procedures for accomplishing work performed at a location other than the repair station's fixed location(s), which should contain the following:

- a) Title of the person responsible for determining the location is appropriate for the work performed.
- b) Title of the person responsible for initiating such work and assigning the personnel necessary to perform inspections and supervise the work.
- c) Procedures for communication between responsible repair station personnel at the fixed location(s) and the maintenance personnel working away from the station. This should include the transfer of parts, supplies, tools/equipment, technical data, and trained personnel.
- d) Procedures that will be used away from the repair station if they deviate from established procedures used at the fixed location(s). The repair station must ensure that all work performed while exercising the privileges of its certificate is accomplished per

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the appropriate maintenance manual and its RSM or QCM. The determination for performing work at another location must meet the following requirements:

1. The work is necessary due to a special circumstance, such as a one time occurrence, as determined by GACA; or
2. It is necessary to perform such work on a recurring, but not continuous, basis and the RSM includes the procedures for accomplishing maintenance, preventive maintenance, alterations, or specialized services at a place other than the repair station's fixed location.

**NOTE:** GACA determination must be made prior to the performance of any maintenance, preventive maintenance, or alterations away from the repair station's fixed location(s) unless an acceptable procedure is included in the manual.

- 7) Procedures for performing maintenance, preventive maintenance, and alterations for certificate holders under GACAR Parts 121, 125 and 135.
- a) GACA requires that maintenance under a Continuous Airworthiness Maintenance Program (CAMP) be performed in accordance with the operator's manual. It is the operator's responsibility to ensure the work performed on its behalf is done in accordance with the CAMP.
  - b) The certificated repair station that performs maintenance, preventive maintenance, or alterations for an operator that has a CAMP must follow the operator's CAMP.
  - c) A certificated repair station that performs inspections for an operator conducting operations under GACAR Part 125 must follow the operator's GACA approved inspection program.
  - d) GACA may authorize a certificated repair station to perform line maintenance on any aircraft of an operator certificated under GACAR Part 121 or 135 provided the certificated repair station:
    - Has the appropriate ratings to perform the maintenance or preventive maintenance on the applicable aircraft

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- Performs such line maintenance in accordance with the operator's manual and approved maintenance program
- Has the necessary equipment, trained personnel and technical data to perform such line maintenance
- Has operations specifications (OpSpecs D107) that include an authorization to perform line maintenance

**NOTE:** A repair station must be appropriately rated to perform line maintenance for an operator. This would normally require an airframe rating to accomplish scheduled checks, daily inspections, or servicing of articles. However, a repair station with the appropriate ratings may accomplish unscheduled maintenance and repairs. This could include avionics facilities limited to avionics functions such as troubleshooting electrical or electronic systems or replacing defective electronic articles.

8) Procedures for maintaining and revising the contract maintenance information, including the submission of revisions to GACA for approval and how often GACA will be notified of revisions.

- a) GACA must approve the maintenance functions to be contracted.
- b) The repair station must maintain a list of each facility that it contracts maintenance functions with, including the type of certificate and ratings (if any) held by each facility.
- c) The maintenance function list does not need to be included in the manual, but the manual should include the location or office where the list is maintained.

**NOTE:** Maintenance functions are a step or series of steps in the process of performing maintenance, preventive maintenance, or alterations which result in approving an article for return to service. It is not the intent of this rule to create "virtual repair stations" that provide only an approval for return to service. Inspectors must evaluate the amount of work a repair station desires to contract out versus the work that is performed in house.

9) A description of the recordkeeping system used by the repair station to obtain, store, and retrieve the records required by GACAR Part 43. These records must be in English.

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10) Procedures for revising the RSM and notifying GACA of revisions to the manual, including how often GACA will be notified of revisions. The procedure must include:

- The title of the person authorized to make a revision
- The method of submitting a revision (electronic, hard copy, disk, etc.)
- A procedure for recording a revision and a method of identifying the revised material or text
- A description of the system used to identify and control sections of the RSM

### **4.10.2.13. QCM PROCEDURES.**

**NOTE:** The QCM may be separate from the RSM or included in the RSM as a separate section or volume.

**A. Documentation, Inspections, and Training.** A certificated repair station must prepare and keep current a QCM in a format acceptable to GACA. Depending upon the size, complexity, and rating(s) of the repair station, that manual should include a description of the system and procedures used for:

- 1) Receiving and documenting articles, standard parts, and raw materials.
- 2) Performing incoming inspections of raw materials and standard parts that check for:
  - Proper documentation, identification, and traceability
  - Conformity to a specification and acceptable quality
  - Shelf life
  - Contamination
  - Shipping damage
  - State of preservation

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3) Performing preliminary inspection of all articles that are maintained or altered to check for:

- Proper documentation, identification, and traceability
- Shipping damage and contamination
- State of preservation
- Life limits
- Airworthiness Directives (AD) and Service Bulletins
- Functional test or tear down inspections
- Determination of what repairs are necessary

4) Inspecting all articles that have been involved in an accident for hidden damage before maintenance, preventive maintenance, or alteration is performed. Ensure that items are disassembled as necessary and inspected for hidden damage in adjacent areas.

5) Performing in progress inspections to ensure inspections, testing, and/or calibration are conducted at various stages while the work is in progress.

6) Performing final inspections and approvals for return to service.

- a) Ensures the inspection, testing, and/or calibration of articles, including documentation, is accomplished at the completion of maintenance or alteration.
- b) The manual must include a procedure for approval for return to service.

7) Ensuring continuity of inspection responsibility.

- a) Include procedures for ensuring that the responsibilities of any inspector are properly performed in their absence.
- b) If the repair station has multiple shifts, include procedures to ensure the continuing responsibility for maintenance in progress through the use of a status book, shift

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turnover log, or similar documents.

- 8) Calibrating measuring and test equipment used in maintaining articles, including the intervals at which the equipment will be calibrated.
- 9) Taking corrective action on deficiencies related to repair station operation.
  - a) GACAR § 145.91(c)(1)(x) states that the QCM must include procedures used for taking corrective action on deficiencies. A corrective action is taken to remedy an undesirable situation. The correction of deficiencies is normally an integral part of a repair station's improvement process, and could include revisions to procedures that were not working properly.
  - b) Corrective action requires that a fact based investigation determine the root cause or causes to eliminate them. Corrective action would be applicable in two situations: Before the article is approved for return for service and after the article has been approved for return to service.
  - c) If a deficiency is found before the article is approved for return to service, the repair station should follow its procedures describing how rework will be accomplished. If the deficiency is noted after the article is approved for return to service, the repair station should follow its procedures to notify the GACA and the owner/operator of any potential problems and recall any un-airworthy parts or products. The objective of the investigation into the cause of the deficiency and the corrective actions taken is to eliminate any potential safety threats posed by unapproved or improperly maintained parts or products and to prevent a recurrence of the same or similar problems.
  - d) The procedures in the QCM should include a system for documenting any deficiencies and the corrective actions taken to prevent a recurrence. The system should let employees track any open corrective action requests and the date the corrective action is due. The program should also be tracked to include audits of the corrective action(s) taken to ensure it was effective. These audits should also be tracked to ensure that they are completed in a timely fashion.
- 10) Establishing and maintaining proficiency of inspection personnel.
  - a) The procedure should ensure that inspection personnel are familiar with the

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applicable regulations and are proficient at inspecting the articles they are assigned to inspect.

b) Testing, formal training, recurrent training, or a combination of these methods could be used to maintain the proficiency of inspection personnel.

11) Establishing and maintaining current technical data for maintaining articles.

12) Revising the repair station's quality manual and notifying its GACA of revisions to the manual, including how often GACA will be notified of revisions. The procedure must include:

- The title of the person authorized to make a revision
- The method of submitting revisions (electronic, hard copy, disk, etc.)
- A procedure for recording revisions and a system for identifying revised material or text

13) Qualifying and surveying non-certificated persons who perform maintenance, preventive maintenance, or alterations for the repair station. A certificated repair station may contract a maintenance function pertaining to an article to a non-certificated person, provided that:

- The non-certificated person follows a quality control system equivalent to the system followed by the certificated repair station
- The certificated repair station remains directly in charge of the work performed by the non-certificated person
- The certificated repair station verifies, by testing and/or inspecting, that the work has been performed satisfactorily and that the article is airworthy before approving it for return to service
- The non-certificated person's contract allows GACA to inspect or observe work being performed on any articles for the certificated repair station

**B. Manual References.** Where applicable, the manual should contain references to the

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instructions for continued airworthiness, maintenance manuals, inspection standards, or other approved or accepted data specific to the article being maintained.

**C. Inspection and Maintenance Forms.** A sample of each of the inspection and maintenance forms used in the performance of maintenance and the instructions for completing those forms.

### 4.10.2.15. TASK OUTCOMES.

**A. Complete the GAR.**

**B. Complete the Task.** Completion of this task will result in the following actions:

- If no regulatory conflicts were found, GACA may send a transmittal document acknowledging receipt of the manuals
- If conflicts with the rule are noted, the PI will detail those discrepancies in writing to the certificate holder
- Approve the training program or a revision by sending the certificate holder a letter indicating the date; document, manual, or revision number; and an approval statement

**C. Use of Electronic Transmissions (E mail or Facsimile).** E mail or fax responses are an acceptable alternative to the cover letter if the repair station is equipped to transmit and receive any necessary attachments. This may include the use of electronic signatures. This method should be addressed in the repair station's procedures and found acceptable to GACA.

**D. Rejection.** Reject the manual(s) or revisions by doing the following:

- 1) Initiate a cover letter indicating the date and document, manual, or revision number of the document or manual being rejected.
- 2) Return all copies to the applicant with an explanation of discrepancies that must be corrected and instructions for resubmitting the documents in order to proceed with the certification or revision process.

**E. Acceptance.** Once the certificate holder receives the acceptance of the RSM and/or QCM, or the approval of the training program and/or manual, copies of the manuals or disks must be provided

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to GACA. The PI will file a copy in the certificate holder's office file along with a copy of the acceptance letter.

- 1) In a paper revision, the PI will remove the affected pages and insert the revised pages in the manuals or the training program. The PI will update the manual control system and file the cover letters in the office file.
- 2) In an electronic format, the PI will replace the outdated disk with the current or initial manual or training submission. The PI will place a copy of the acceptance letter in the certificate holder's office file.

**F. Document the Task.** File all supporting paperwork in the certificate holder's office file.

**4.10.2.17. FUTURE ACTIVITIES.** Perform follow-up inspection, as appropriate.

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#### **CHAPTER 10. PART 145 ADMINISTRATION**

##### **Section 3. Evaluate Repair Station Facilities and Equipment for Part 145**

###### **4.10.3.1. GACA ACTIVITY REPORT (GAR).**

- A. 3378 (AW) (Evaluate Facility)

**4.10.3.3. OBJECTIVE.** This section provides evaluation and inspection guidance for a General Authority of Civil Aviation Regulations (GACAR) Part 145 repair station for original certification, change in rating, change in location, or adding facilities.

###### **4.10.3.5. GENERAL.**

A. When determining the suitability of permanent housing or other facilities used for the maintenance of an aeronautical product or article, the Inspector should consider climatic conditions. This is to determine if high or low temperatures, excessive dust or sand, or other conditions will adversely affect worker efficiency. The principal inspector (PI) should also consider the maintenance being performed to determine if work processes are adversely affected by environmental conditions.

B. Applications for a repair station certificate, amendment to, transfer of, or an additional rating must be made in a format acceptable to the General Authority of Civil Aviation (GACA) and comply with the requirements of GACAR Part 145. Additional guidance for the certification and operation of a GACAR Part 145 repair stations may be found in Volume 3, Chapter 11, The Certification Process for Part 145, as well as Federal Aviation Administration (FAA) Advisory Circular (AC) 145-9 (as amended), Guide for Developing and Evaluating Repair Station and Quality Control Manuals.

###### **4.10.3.7. REPAIR STATION INSPECTION.**

**NOTE:** The following procedures apply to all repair stations regardless of their geographic location.

- A. Each certificated repair station must provide the following:

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- 1) Housing for the facilities, equipment, materials, and personnel consistent with its ratings.
- 2) Facilities for properly performing the maintenance, preventive maintenance, or alterations of articles, or the specialized services for which it is rated. Facilities must include the following:
  - a) Sufficient work space and areas for the proper segregation and protection of articles during all maintenance, preventive maintenance, or alterations.
  - b) Segregated work areas enabling environmentally hazardous or sensitive operations such as painting, cleaning, welding, avionics work, electronic work, and machining to be done properly and in a manner that does not adversely affect other maintenance or alteration articles or alterations.
  - c) Suitable racks, hoists, trays, stands, and other segregation means for the storage and protection of all articles undergoing maintenance, preventive maintenance, or alteration.
  - d) Space sufficient to segregate articles and materials stocked for installation from those articles undergoing maintenance, preventive maintenance, or alteration.
  - e) Ventilation, lighting, and control of temperature, humidity, and other climatic conditions sufficient to ensure personnel perform maintenance, preventive maintenance, or alterations to the standards required by this part.

**B.** A certificated repair station with an airframe rating must provide suitable permanent housing to enclose the largest type and model of aircraft listed on its operations specifications (OpSpecs).

**NOTE:** Each certificated repair station must have a fixed location where materials, equipment, tools, and data are stored. While consideration can be given for certain operating situations, Inspectors must not authorize “virtual” or completely “mobile” repair stations. Even though the majority of the work is done away from the fixed location, each repair station must have a permanent, fixed base from which it operates the repair station.

- 1) PIs should evaluate the housing needs of the repair station based upon the depth and complexity of the work the repair station will perform. For example, if an airframe rated repair station will only be doing interior refurbishment or interior electrical work that does not

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require the aircraft to be completely housed, a nose dock or other similar housing may suffice for the housing requirement. Any work done on removed aircraft components must be accomplished in an appropriate housing, back shop, or other permanent structure.

2) Repair stations that frequently work away from their fixed location must ensure another certificate holder's housing and facilities are adequate and meet the requirements of the regulations for the ratings that they hold. Procedures should be included in their manuals that describe how they will evaluate a certificate holder's facilities prior to performing maintenance under the privileges of their certificate at the facility.

3) Some repair stations, such as internal fuel tank repair stations, do not require housing that will enclose the largest aircraft listed on their OpSpecs. Most of this type of work is performed in the aircraft wing, and protection from the elements should not be a major consideration. The use of mobile coverings to protect articles being installed or removed from the wing should provide sufficient protection from the elements.

**C.** A certificated repair station may perform those maintenance functions for which it is rated on articles outside of its housing if it provides suitable facilities that are acceptable to the GACA. The facility must meet the requirements of GACAR § 145.39(a) and the work must be done in accordance with the requirements of GACAR Part 43.

**D.** A certificated repair station may perform maintenance, preventive maintenance, or alterations for the following certificated operators:

1) A GACAR Part 121 or 135 operator that has a continuous airworthiness maintenance program (CAMP) and the repair station must follow their program and applicable sections of their maintenance manual.

2) GACAR Part 125, 133 and 135 operators and the repair station must follow the operator's GACA approved aircraft inspection program.

**E.** A certificated repair station may be authorized to perform line maintenance for an operator certificated under GACAR Part 121 or 135, or a foreign operator, provided:

1) The repair station performs such line maintenance in accordance with the operator's manual and approved maintenance program.

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2) The repair station has the necessary equipment, trained personnel, and technical data to perform such line maintenance.

3) The repair station OpSpecs D107 includes an authorization to perform line maintenance.

**NOTE:** All certificated repair stations must have suitable permanent housing and facilities. Although GACAR § 145.83(c) allows some deviation from the housing requirement, that requirement is based upon the repair station having suitable housing at another location that meets the requirements of GACAR Part 145. If line maintenance is the only maintenance a repair station is certificated to perform, the repair station must still meet the housing and all other applicable requirements of GACAR Part 145.

**F.** A repair station may have the need to perform maintenance away from its permanent fixed base of operation. This requirement may be necessary due to a special circumstance, as determined by the GACA, or may be recurring based on a repair station's need. Such work may include, but not be limited to:

- Aircraft recovery
- Testing of systems on aircraft operating under Instrument Flight Rules (IFR)
- Fuel cell maintenance
- Nondestructive Testing (NDT) inspections
- Interior modifications

1) A repair station performing maintenance away from its fixed location(s) may transport the materials, equipment, and technical personnel to the aircraft location or facility to facilitate the required maintenance.

2) At no time while performing work away from its fixed location(s) will the work scope exceed the capabilities for which the repair station is rated.

3) A repair station that performs maintenance functions away from its fixed location(s) on a recurring basis must ensure the temporary facility it uses meets the requirements of GACAR § 145.39(a).

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4) The repair station must ensure that its repair station manual includes the procedures for accomplishing maintenance, preventive maintenance, alterations, or specialized services at a place other than the repair station's fixed location(s).

G. A repair station may need to perform maintenance at multiple fixed locations.

1) Repair stations using multiple fixed locations under a single certificate need not have all the tools, equipment, data, or personnel at each location. The repair station's primary fixed base and any additional fixed locations are considered a single repair station. Each facility address must be listed in the repair station OpSpecs A101. This situation is not considered work away from the station.

2) The repair station manual must incorporate procedures that reflect how the repair station will meet the requirements of GACAR Part 145 at each of its facilities. The procedures must include any supplemental operations (i.e., movement of articles, equipment, or tools required to perform the work) that may affect the repair station's ability to ensure the airworthiness of the articles maintained by the repair station. The repair station remains directly in charge of the work performed at all fixed locations.

3) All fixed location addresses must be listed on the repair station's OpSpecs A101. The repair station must submit a written request/application to use additional locations prior to exercising the privileges of its certificate and ratings at the additional fixed locations. The GACA must inspect and approve each location and update the OpSpecs with the address for each additional location.

4) There also may be instances where an engine test cell facility is located away from the primary facility but operates under the same certificate as the primary facility. This may occur when:

a) GACA determines that the separate locations do not have any significant impact on the maintenance performed, and the separate locations are under the full control of the primary facility

b) The separate facilities must be in a defined area relative to the primary facility, and located within the same country. A GACA aviation safety inspector (Inspector) must be able to use ground transportation to get from one facility to another without major expense or inconvenience.

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**4.10.3.9. COORDINATION REQUIREMENTS.** None.

**4.10.3.11. REFERENCES, FORMS, AND JOB AIDS.**

**A. References.**

- GACAR Parts 43, 66, 91, 121, 125, and 133, 135
- FAA AC 145 9 (as amended), Guide for Developing and Evaluating Repair Station and Quality Control Manuals

**B. Forms.** GAR.

**C. Job Aids.** None.

**4.10.3.13. PROCEDURES.**

**A. Review Documentation.** Review the Repair Station Certificate Manuals/Revision, Capabilities Listing, and OpSpecs for accuracy to determine that ratings are appropriate for work being performed, for accuracy. Also determine if maintenance functions will be contracted out, and contracted persons will meet the requirements of GACAR § 145.99.

**B. Evaluate the Housing and Facilities.** Inspect the following:

1) Housing and shop areas to ensure the following:

- a) Adequate housing includes sufficient workspace for maintenance functions to be accomplished.
- b) If a repair station holds an airframe class rating or limited airframe (specific model aircraft) rating, that housing includes suitable permanent housing for the largest type and model aircraft listed on its OpSpecs.

**NOTE:** If climatic conditions allow, the repair station may perform maintenance, preventive maintenance, or alterations outside of its housing if these facilities are acceptable to the GACA and meet the requirements of GACAR § 145.39(a).

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c) Proper storage and protection of:

- Materials
- Parts
- Supplies

d) Proper identification and protection of parts and subassemblies during:

- Disassembly
- Cleaning
- Inspection
- Repair
- Alteration
- Assembly

e) Segregation of the following:

- Incompatible work areas (e.g., metal shop, battery charging area, or painting area next to an assembly area)
- Un-partitioned parts cleaning areas
- Articles and materials stocked for installation from those articles undergoing maintenance or alteration

f) Proper ventilation, lighting, and temperature and humidity for the type and complexity of work being accomplished.

2) Technical documents to ensure that they are current and accessible when relevant work is being performed:

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- Airworthiness Directives (AD)
- Instructions for Continued Airworthiness (ICA)
- Maintenance manuals
- Overhaul manuals
- Standard practice manuals
- Service Bulletins
- Other applicable data acceptable to or approved by the GACA

3) Equipment, tools, and test equipment, to ensure:

- a) Required types and quantities are available and under the control of the repair station during performance of the work function.
- b) All test and inspection equipment and tools used to make airworthiness determinations are calibrated to a standard acceptable to the GACA.
- c) A repair station may substitute manufacturers' tooling with one that is of its equivalent. If the repair station uses equivalent tooling it is responsible for the determination of equivalency. The repair station must provide a means to the GACA that will demonstrate that the tool meets the manufacturer's standards and specifications with all respects regarding tolerances and accuracy.

1. The special equipment or test apparatus must be capable of performing all normal tests and checking all parameters of the equipment (article) under test. The level of accuracy should be equal or better than that recommended by the manufacturer.
2. The equivalency can only be made based upon an evaluation of a technical data file. The repair station will establish a technical data file for each piece of equivalent tooling. The file will contain, but is not limited to, data, drawings, specifications, instructions, photographs, templates, certificates, and reports.

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- a. In the case of calibration equipment, the technical data file should also include data sheets attesting to the accuracy when calibration standards are necessary, as well as any special manufacturing processes that are used, including gauges and recording equipment in the controlling process.
  - b. If calibration equipment is involved, adequacy of that calibration system shall be established with documented procedures to evaluate the adequacy of that calibration equipment and its traceability to one of the previously listed standards.
3. A demonstration of the functionality of the special equipment or test apparatus may be necessary to determine its equivalency.

**NOTE:** It is important to emphasize that the burden of demonstrating equivalency is borne by the repair station and not the GACA.

**C. Analyze Findings.** If deficiencies were found, meet with the certificate holder to discuss possible corrective actions.

### 4.10.3.15. TASK OUTCOMES.

**A. Complete GAR.**

**B. Complete the Task.** Completion of this task will result in one of the following:

1) If the facilities were found acceptable:

- An entry into the GAR stating satisfactory/or entries in the comment section
- A letter to the repair station acknowledging the successful completion of the inspection (optional)

2) If the facilities were found unacceptable:

- Compliance enforcement as prescribed in Volume 13
- A follow-up evaluation to ensure that the repair station is in compliance with

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regulations

**C. Document Task.** File all supporting paperwork in the certificated repair station's file.

**4.10.3.17. FUTURE ACTIVITIES.** Perform follow-up inspection, as appropriate.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 10. PART 145 ADMINISTRATION**

##### **Section 4. Testing of Powerplants After Overhaul**

**4.10.4.1. OBJECTIVE.** This section provides guidance to ensure that powerplant overhaul facilities accomplish the testing of powerplants after overhaul per the maintenance procedures recommended by the engine manufacturer.

##### **4.10.4.3. GENERAL.**

**A. Manufacturer Recommended Procedures.** Powerplant manufacturers are very specific in their recommended procedures for powerplant testing after overhaul. This testing is required to run in new parts, check powerplant performance, and check the quality of the work performed during overhaul. The procedures to be followed in overhaul testing of a powerplant vary by make and model, but are clearly outlined in the manufacturer's manual.

**B. Practices Acceptable to the President.** General Authority of Civil Aviation Regulation (GACAR) § 43.19 requires that each person performing maintenance must use methods, techniques, and practices acceptable to the President. If special equipment or test apparatus is recommended by the powerplant manufacturer, that equipment or apparatus or an equivalent acceptable to the President must be used.

**C. Outside Agencies Performing Overhaul Testing.** A powerplant overhaul agency that requests another agency to perform the overhaul testing should have established procedures for that testing. The procedures should show the following:

- The agency that is to perform the test has the information necessary to complete the test properly

##### **D. Powerplant Overhaul Testing Environment.**

1) *Turbine engine testing.* Since the performance of a turbine engine is greatly affected by the surrounding atmospheric conditions, most turbine engine manufacturers recommend that powerplant testing after overhaul be accomplished in the controlled conditions of a test facility/cell equipped as outlined in the manufacturer's overhaul manual.

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2) *Reciprocating engine testing.* The manufacturers of reciprocating engines allow the airframe to be considered a suitable test stand for the running in of overhauled engines, provided the following requirements are observed:

- A test club is used in place of a flight propeller
- A suitable cooling shroud or scoop is used to gather and direct cooling air over the cylinders
- A cylinder head temperature pickup is installed on each cylinder to monitor individual cylinder temperature
- All necessary calibrated gauges are installed independent of the aircraft gauges

3) When other methods for testing come to the attention of aviation safety inspectors (Inspectors), the methods should be evaluated to determine if they are equivalent to the above requirements. When noncompliance with GACAR § 43.19 is evident, corrective action must be initiated to correct any discrepancies.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 11. OPERATOR RECORDKEEPING FOR PARTS 121, 125, 133 AND 135**

##### **Section 1. General**

**4.11.1.1. GENERAL.** This chapter contains information and guidance to be used by aviation safety inspectors (Inspectors) when evaluating an operator's recordkeeping system. This section contains a general overview of proprietary information, the regulatory requirements for recordkeeping under General Authority of Civil Aviation Regulations (GACAR) Parts 121, 125, 133 and 135, and definitions of terms as they relate to operator recordkeeping. Section 2 contains information and guidance about the acceptance or approval of an operator's recordkeeping system. Section 3 contains information and guidance about retention of records. Section 4 contains information about electronic recordkeeping systems and the use of electronic signatures. Section 5 contains information about maintenance recordkeeping for Part 121 operators and other operators using a CAMP. Section 6 contains information about maintenance recordkeeping for Part 135 operators.

**NOTE:** The guidance in section 4 concerning electronic recordkeeping systems and the use of electronic signatures is also applicable to, and may be used, when evaluating electronic recordkeeping systems used under GACAR Part 141, 142, 143, 144, 145 and 147.

**4.11.1.3. CHARACTERISTICS OF INFORMATION AND RECORDS.** Operators collect and use both information and records in the conduct of operations.

**A. Information versus Record.** Inspectors should be aware of the difference between a recordkeeping system and a management information system. A record is defined as an account which preserves evidence of the occurrence of an event. In general, a record must show what event occurred, to whom, by whom, when, and proof of the event's occurrence, such as a certification by signature or by electronic means. A system that collects related information for making operational decisions but does not preserve evidence of the event's occurrence is a management information system and not a recordkeeping system.

**B. Proprietary Information.** Proprietary information is that information which is the sole property of the operator. Inspectors frequently acquire proprietary information in the process of conducting inspections and investigations. Inspectors may use such information for official purposes but may not divulge such information to third parties. For example, if an operator

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chooses to maintain flight and rest records on a payroll form, the operator must make the record available for inspection. Inspectors must take care not to divulge proprietary information such as rates of pay or dollar amounts.

**4.11.1.5. REGULATORY REQUIREMENTS.** GACAR Parts 121, 125, 133 and 135 require that operators maintain certain records on crew members and dispatchers participating in flight operations. Parts 121, 125, 133 and 135 also specify certain regulatory requirements for recordkeeping.

**A. Part 121.** GACAR §121.1505 requires that operators maintain current records to show that each crew member and dispatcher, as applicable, complies with proficiency and qualification requirements as stated in this chapter. GACAR § 121.1505 also requires that operators record each action taken concerning the release from employment or physical or professional disqualification of any flight crew member or dispatcher and retain that record for 6 months. GACAR § 121.1565 specifies retention periods for all records including those required under GACAR § 121.1505. GACA Part 121 Subpart Q also specifies retention periods for load manifests, flight or dispatch releases, flight plans, and en route radio contact between the operator and the operator's pilots. GACAR § 121.1567 specifically addresses the requirements for electronic recordkeeping systems including the approval of electronic signature systems.

**B. Part 125.** GACAR § 125.531(c) requires that operators maintain current records to show that each crew member complies with proficiency and qualification requirements. Part 125, Subpart Q, Records and Reports, specifies requirements for other forms, reports, logs, records, and signature authorities. GACAR § 125.543 specifies requirements when electronic recordkeeping systems are used, how electronic signature systems are approved, and procedures for their use.

**C. Part 133.** GACAR § 133.171 requires that operators keep certain records at either the principal business office or another place approved by the GACA, and establish retention periods for certain required records. GACAR § 133.181 specifies requirements when electronic recordkeeping systems are used, how electronic signature systems are approved, and procedures for their use.

**D. Part 135.** GACAR § 135.689 requires that operators keep certain records at either the principal business office or another place approved by the GACA, and establish retention periods for certain required records. GACAR § 135.699 specifies requirements when electronic recordkeeping systems are used, how electronic signature systems are approved, and procedures for their use.

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**E. Other.** In order for an operator to show regulatory compliance and to allow the General Authority of Civil Aviation (GACA) to conduct surveillance to determine this compliance, the operator may elect to maintain other types of records, such as extended-range operations with two-engine airplanes (ETOPS) and navigation records, even though they are not specifically mentioned in Parts 121, 125, 133 or 135. Other examples are company flight instructor and check pilot training records.

**4.11.1.7. DEFINITIONS.** The following definitions are used throughout this chapter:

**A. Authentication.** This is the means by which a system validates the identity of an authorized user. These may include a password, a personal identification number (PIN), a cryptographic key, a badge, a stamp, or another means as approved by the President.

**B. Calendar Month.** A calendar month is the first day through the last day of a particular month.

**C. Computer-Based Recordkeeping System.** A system of record processing in which records are entered, stored, and retrieved electronically by a computer system rather than in traditional hard copy form. This is synonymous with an electronic recordkeeping system.

**D. Computer Hardware.** A computer and the associated physical equipment directly involved in the performance of communications or data processing functions.

**E. Computer Software.** Written or printed data, such as programs, routines, and symbolic languages essential to the operation of computers.

**F. Control.** A person has control of a transferable record if a system employed for evidencing the transfer of interests in the transferable record reliably establishes that person as the person to which the transferable record was issued or transferred.

**G. Conditions.** A system satisfies “control,” and a person is deemed to have control of a transferable record, if the transferable record is created, stored, and assigned in such a manner that:

- 1) A single authoritative copy of the transferable record exists which is unique, identifiable, and (except as otherwise provided in subparagraphs 4, 5, and 6 below), unalterable.
- 2) The authoritative copy identifies the person asserting control as:

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- The person to whom the transferable record was issued
  - The person to whom the transferable record was most recently transferred, if the authoritative copy indicates that the transferable record has been transferred
- 3) The authoritative copy is communicated to and maintained by the person asserting control or its designated custodian.
- 4) Copies or revisions that add or change an identified assignee of the authoritative copy can be made only with the consent of the person asserting control.
- 5) Each copy of the authoritative copy and any copy of a copy is readily identifiable as a copy that is not the authoritative copy.
- 6) Any revision of the authoritative copy is readily identifiable as authorized or unauthorized.

**H. Data Backup.** Use of one of several recognized methods of providing a secondary means for storing records. This backup can be used to reconstruct the format and content of electronically stored records in case of loss of, failure of, or damage to the primary recordkeeping system.

**I. Database Management System (DBMS).** A computer software program capable of maintaining stored information in an ordered format, manipulating that data by mathematical methods, and performing data processing functions such as retrieval of data.

**J. Data Entry.** This is the process by which data or information is entered into a computer memory or storage medium. Sources include manually written records, real-time information, and computer-generated data.

**K. Data Verification.** A process of assuring accuracy of data records by systematically or randomly comparing electronic records with manual data entry documents.

**L. Digital Signature.** A digital signature is cryptographically generated data that identifies a document's signatory (signer) and certifies that the document has not been altered. Digital signature technology is the foundation of a variety of security, e-business, and e-commerce products. Based on public/private key cryptography, digital signature technology is used in a variety of electronic information security applications such as: secure messaging, public key

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infrastructure (PKI), virtual private networks (VPN), and web standards for secure transactions, and electronic digital signatures.

**M. Electronic Mail.** The transmittal of messages, documents, or other communications between computer systems or other telecommunication channels.

**N. Electronic Record.** A contract, Operations Specifications (OpSpecs), or other record created, generated, sent, communicated, received, or stored by electronic means. A system for maintaining electronic records is referred to synonymously as an electronic recordkeeping system or a computer-based recordkeeping system.

**O. Electronic Signature.** An electronic sound, symbol, or process attached to, or logically associated with, a contract or other record and executed or adopted by a person with the intent for electronically identifying individuals entering, verifying, or auditing computer-based, electronic records, and checking for authenticity. An electronic signature combines cryptographic functions of a digital signature with the image of an individual's handwritten signature or some other form of visible mark that would be considered acceptable in a traditional signing process. It authenticates data with a hash algorithm and provides permanent secure user authentication.

**P. Electronic Technology.** Relating to or having electrical, digital, magnetic, wireless, optical, electromagnetic or similar capabilities.

**Q. Eligibility (Grace) Provision.** Eligibility for a recurrent training event is normally associated with the due date for a training requirement and is usually a period of three calendar months. It refers to the calendar month before the training/ checking month, the training/checking month (base or due month), and the calendar month after the training/checking month. During this period, a crew member or aircraft dispatcher must receive recurrent training, a flight check, or a competency check to remain in a qualified status. Training or checking completed during the eligibility period is considered to be completed during the training/checking month (base month). For example, if a crew member or aircraft dispatcher whose training/checking base month is August receives the required recurrent training in September, August remains as the training/checking month. Also, if a crew member or aircraft dispatcher fails to complete the required training during the grace period and acquires flight time or functions as a dispatcher during the month following the training/checking month, the crew member or aircraft dispatcher is not in violation of the GACARs since the month following the training/ checking month is

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still considered part of the grace period. Reference GACAR § 121.839(c) or GACAR § 135.355(a) for requirements on grace provisions for operators operating under these regulations.

**R. Modem.** A device that can use existing forms of transmission circuits (telephone, cable, satellite, wireless, etc.) to transfer information between either two or more computer systems, or computers and remote terminals.

**S. Password.** An identification code required to access stored material on a device or system intended to prevent information from being viewed, edited, or printed by unauthorized persons.

**T. Proprietary Information.** This is information that is the private property of the operator.

**U. Real-Time Record.** Information that is entered into an electronic recordkeeping system immediately following the completion of an event or fulfillment of a condition, without first relying on the manual recording of the information on a data entry form.

**V. Records.** All records are information in a predetermined format that shows that the operator or its personnel have accomplished a particular event, have met certain criteria, or have fulfilled specific conditions required by the regulations.

**W. System Security.** Policies, procedures, and system structures designed to prevent users from gaining access to sections of a database to which they are not authorized access.

**X. Remote Access.** Remote access is a means of gaining access to a computer system from a remote location through a telephone modem, existing telephone circuits, or through the internet.

**Y. Training/Checking Month (Base Month).** The calendar month during which a crew member or aircraft dispatcher is due to receive required recurrent training, a required check, or a required familiarization flight.

**Z. User Identification.** A series of alphabetic and/or numeric characters assigned to one or more individuals or organizations for the purpose of gaining access to a computer system and accounting for time usage.

**4.11.1.9. MERGERS AND ACQUISITIONS.** When two or more electronic recordkeeping systems are being consolidated because of a merger or acquisition, the consolidation of the training programs and the recordkeeping systems which correlate to those programs is of particular importance. Accurate

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consolidation of those systems must be given priority by the Inspector. Training records of the acquired company's flight operations personnel must comply with the basic GACAR requirements before being accepted. During this transition, the Inspector shall determine the time period required for maintaining the two systems in parallel operation. Once the record transition plan and the surviving system have been approved by the Inspector, the merged operator should transfer data from the existing systems into the surviving system. The surviving system should have at least the same backup capability as the existing system. The integration of the existing and surviving systems may be accomplished by electronically combining the databases of the two systems or by other methods, as long as the accuracy of the data is maintained.

**A. Unavailable Records.** Due to variances in recordkeeping methods of individual operators, some records may not be available or usable for inclusion in the surviving electronic recordkeeping system. In this case, the operator must reconstruct records from available resources. If there are no resources from which to reconstruct records, assumptions that experienced personnel have accomplished required training may be required. In these cases, the Inspector and operator should agree on a method of identifying portions of a record that are based on these assumptions. The method used to identify this information should be discussed in the operator's manual.

**B. Changes to Existing Recordkeeping System.** The Inspector is responsible for evaluating any request for change to an operator's existing recordkeeping system. Minor changes such as modifications to display formats may not require a formal evaluation and approval. Major changes affecting system operation or capability may require an in-depth evaluation and approval process.

**NOTE:** A change in computer hardware which does not affect functions or capabilities of the system does not constitute a system transition and does not require approval.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 11. OPERATOR RECORDKEEPING FOR PARTS 121, 125, 133 AND 135**

##### **Section 2. Acceptance or Approval Process**

**4.11.2.1. GENERAL.** This section contains information and guidance to be used by aviation safety inspectors (Inspectors) when accepting an operator's recordkeeping system and approving an electronic signature system (when applicable). The recordkeeping acceptance or approval process follows the general five-step acceptance and approval process described in Volume 1, Chapter 4, Section 1, The General Process for Approval or Acceptance. Under General Authority of Civil Aviation Regulation (GACAR) Parts 121, 125, 133 and 135, electronic recordkeeping systems are approved by the General Authority of Civil Aviation (GACA) President for each requesting operator.

**4.11.2.3. REGULATORY REQUIREMENTS.** GACAR Parts 121, 125, 133 and 135 each contain dedicated subparts addressing recordkeeping requirements. The record keeping requirements include a listing of required records and their retention periods (if applicable). Additionally, GACAR §§§ 121.1567, 125.543, 133.181 and 135.699 specify the applicable requirements for electronic recordkeeping systems and require that the GACA approve an operator's electronic signature system. An electronic recordkeeping system that employs electronic signatures is approved by General Authority of Civil Aviation (GACA) via issuance of Operations Specification (OpSpec) A25.

**4.11.2.5. GUIDELINES FOR APPROVAL OR ACCEPTANCE.** During initial certification, the operator should ensure that the initial compliance statement clearly describes the procedures to be used by the operator for the generation and maintenance of required records. After certification, Inspectors shall conduct surveillance of an operator's records on a routine basis to ensure that the records are being maintained. Inspectors shall also ensure that the records continue to contain the required information to show compliance with the GACARs. The operator shall develop a section in its Operations Manual (OM) that provides detailed instruction on the use of the recordkeeping system. This applicable OM section must be provided to the Inspectors as part of the OM review.

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#### **CHAPTER 11. OPERATOR RECORDKEEPING FOR PARTS 121, 125, 133 AND 135**

##### **Section 3. Currency Periods for Records**

**4.11.3.1. GENERAL.** Aviation safety inspectors (Inspectors) shall determine if an operator's recordkeeping system provides the necessary documentation to demonstrate compliance with General Authority of Civil Aviation Regulations (GACARs). In addition, Inspectors should review their assigned operator's training recordkeeping procedures to determine whether the company's quality control measures are adequate to maintain appropriate information on the quality of pilot performance in training and checking programs. To enable the Inspector to determine compliance at any time, the operator must maintain adequate historical data. This section contains information and guidance to be used by Inspectors when determining the necessary retention periods for records.

**4.11.3.3. CATEGORIES OF RECORDS FOR RETENTION.** In order for an operator to demonstrate regulatory compliance, that operator must retain training and qualification records that document currency and prerequisite qualifications.

**A. Permanent Records.** Permanent records are the documentation of the successful completion of training or qualification events which are prerequisites for subsequent assignments. As specified by the appropriate GACAR operating part, an operator must retain these records for the duration of the individual's employment to substantiate the individual's qualifications. Examples of permanent records include the following:

- Basic indoctrination records
- Initial qualification records
- Transition and upgrade aircraft training records
- Required operating experience (OE) observation by the General Authority of Civil Aviation (GACA) Inspector records

**B. Currency Records.** Currency records are the documentation of training or qualification events which maintain qualification of individuals for their present assignments. Individuals must re-accomplish these training and qualification events at scheduled intervals as specified in the

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appropriate GACAR. In order to show an individual's continuity of qualification, operators must retain this type of record until it is superseded by a record of similar training or qualification.

**NOTE:** Many operators revise Line-Oriented Flight Training (LOFT) scenarios annually in order to preclude any crew member from receiving the same scenario more than once. An operator that revises LOFT scenarios less frequently should be required to maintain additional records to ensure that the crew member does not receive the same scenario in two consecutive training cycles.

**C. Records of Action.** The GACARs require that an operator maintain a record of each action taken concerning the release from employment or physical or professional disqualification of any flight crew member or aircraft dispatcher for a specified period of time. The GACARs also specify how long an operator must retain certain employee's permanent records before they may be discarded after release, termination, or disqualification from employment.

**D. Additional Records.** The operator may need to keep additional operational and aircraft records, such as a condition of special operational authorizations. For example, the GACA requires the operator to keep a record of successful operation before the GACA can grant approval to increase the extended twin operations (ETOPS) en route alternate time requirements from 90 minutes to 120 minutes or more. Aircraft records must be maintained in accordance with recordkeeping requirements specific to each GACAR operational part. The GACA may require operators to keep additional training and qualification data in order to justify changes in the authorization of such areas as ETOPS, training hour reductions, and Operations Specifications (OpSpecs). Inspectors should encourage operators to establish additional recordkeeping for analysis purposes in areas requiring documentation. Operators may depersonalize those records not required by the regulations.

**E. Company Manuals and Similar Documents.** While not "records," these documents may also be authenticated by digital or electronic signature so long as the electronic signature system is approved by the President.

**NOTE:** Operators that have been granted exemptions to the regulations may be required by the terms of those exemptions to retain additional records for a specified period.

**4.11.3.5. RETENTION PERIODS FOR RECORDKEEPING SYSTEMS.** When evaluating any recordkeeping system, Inspectors must ensure that the system has the capability for entry, storage,

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retrieval, and archiving of all required records. The system must be capable of retaining all required records for the periods specified in the applicable regulation for that operator. Inspectors should reference GACAR §§ 121.1565, 125.531 and 135.689 and Subpart O of GACAR Part 133 for the record retention requirements specific to these types of operators.

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#### **CHAPTER 11. OPERATOR RECORDKEEPING FOR PARTS 121, 125, 133 AND 135**

##### **Section 4. Electronic Recordkeeping**

**4.11.4.1. GENERAL.** Electronic or computer-based recordkeeping systems allow operators more flexible and efficient maintenance of records. Some electronic recordkeeping systems offer electronic communications capabilities which benefit both the operator and the General Authority of Civil Aviation (GACA). This section contains information and guidance to be used by aviation safety inspectors (Inspectors) when evaluating and accepting an operator's request to use an electronic recordkeeping system.

**4.11.4.3. REGULATORY REQUIREMENTS.** General Authority of Civil Aviation Regulations (GACAR) Parts 121, 125, 133 and 135 require that operators maintain specific records on many different facets of operator training, operation, and maintenance. Records may be maintained in paper form or in an electronic recordkeeping system. GACAR §§§ 121.1567, 125.543, 133.181 and 135.699 address the requirements to gain acceptance for computer-based, electronic recordkeeping systems. When an operator chooses to utilize electronic signatures in an electronic recordkeeping system, their use in that system is approved by the GACA through the issuance of Operations Specification (OpSpec) A25.

**4.11.4.5. GUIDELINES FOR SYSTEM ACCEPTANCE or APPROVAL.** Operators need GACA acceptance to utilize an electronic recordkeeping system. Inspectors shall ensure that operators follow certain guidelines and submit certain information when planning to utilize an electronic recordkeeping system. Inspectors may accept the requesting operator's electronic recordkeeping system when all requirements have been evaluated and met.

**A. Evaluation Process.** Operators may utilize an electronic recordkeeping system that is designed to satisfy either all regulatory recordkeeping requirements or specific regulatory recordkeeping requirements, such as training records. When evaluating an electronic recordkeeping system, Inspectors shall ensure that the proposed system provides a means of maintaining accurate, timely, and reliable records required by the GACARs. When accepting the system, Inspectors shall follow the general five-step acceptance process described in Volume 1, Chapter 4, Section 1, The General Process for Approval or Acceptance.

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- 1) Operators must apply for acceptance of their proposed electronic recordkeeping system; and when employed, for approval of their proposed electronic signature system, by letter.
  - a) The letter of application must contain sufficient information to enable the Inspector to evaluate and determine that the proposed electronic recordkeeping and/or electronic signature system complies with the requirements in the Electronic Recordkeeping subsection (b) of the applicable operating GACAR regulation for that operator (GACAR §§ 121.1567, 125.543, 133.181 or 135.699).
  - b) The letter of application must specify the categories and types of records which will be maintained by the electronic recordkeeping system and which records will utilize electronic signatures (when employed).
- 2) The Inspector shall ensure that all operators which request acceptance of an electronic recordkeeping system retain data entry forms or other pertinent non-electronic records in a parallel record system during the evaluation. The Inspector shall ensure that all required records continue to be maintained while the electronic recordkeeping system is being installed, tested, and evaluated; and that data entry personnel are being trained to recognize regulatory terminology and requirements.

### **B. System Evaluation.** Inspectors shall evaluate the electronic recordkeeping system's capabilities and level of security.

- 1) Prior to approval, the Inspector should carefully evaluate the proposed electronic recordkeeping system to ensure that the system is capable of providing accurate, timely, and reliable records, as required by the GACARs. The Inspector shall review the operator's proposed transition plan and manuals, and observe operation of the operator's existing recordkeeping system in parallel operation with the proposed electronic system. The extent of this evaluation depends on the complexity of the proposed system and its intended use. The evaluation of a system designed to comply with all regulatory requirements should be much more complex than that of a system designed to maintain records in one specific category. The Inspector shall ensure that the regulatory requirements for system security, record retention periods, and data backups are adequate. Potential problem areas should be identified and corrected prior to acceptance.
- 2) Inspectors shall evaluate the proposed system's level of security to ensure that the database is adequately protected.

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- a) To maintain integrity of the database and associated records, the Inspector should coordinate with the operator during the approval process concerning which GACA personnel should have access to the operator's recordkeeping system. One frequently used approach is to rely on controlled user access codes and passwords.
- b) A representative designated by the operator should actively monitor user access and periodically review access control requirements. This representative shall be specifically identified and authorized in the operator's proposal and manuals.
- c) A signature may be in the form of a digital or electronic signature, a digitized image of a paper signature, a typed notation, an electronic code, or any other unique form of individual identification that can be used as a means of authenticating a record, record entry, or document. The use of digital electronic signatures enhances the ability to identify a signatory and helps to eliminate the traceability difficulties associated with illegible handwritten entries and the deterioration of paper documentation. The purpose of a digital electronic signature is identical to that of a handwritten signature or any other form of signature currently accepted by the GACA. The handwritten signature is universally accepted because it has certain qualities and attributes that should be preserved in any digital or electronic signature process. Therefore, to be considered acceptable, a digital or electronic signature should possess those qualities and attributes intrinsic to a handwritten signature that guarantee its authenticity.
  - 1. The operator may establish a procedure for allowing designated personnel such as flight instructors/check pilots, aircraft dispatcher supervisors, and cabin crew member supervisors to electronically certify all record entries for which they are responsible. This certification may take one of many forms, such as full name, initials, or unique identification number. The operator may devise a system that requires the validating official to either enter a real-time record into the system or complete a written transmittal document to be given to data entry personnel. If a written transmittal document is used, the identification of the validating official must become part of the record.
  - 2. A computer entry used as a signature should have restricted access that is limited by an authentication code which is changed periodically. The operator should include this in the description of its signature process(es) as approved in OpSpec A25.

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- d) Where deemed appropriate, GACA personnel assigned to the operator should be provided with an access level which allows unrestricted data retrieval of all records required by the GACARs. If the operator elects to use the electronic recordkeeping system's capability for electronic designation of aircrew-designated examiners and check pilots, an appropriate level of access should be provided to the Inspector or a designated representative to allow necessary data entries.
- 3) The Inspector shall verify that the operator has established a backup capability to generate a complete set of duplicate records, either electronic or non-electronic. These records should be stored in a location separate from the main information storage facility. These records may be stored in any form acceptable to the Inspector.
- 4) The operator shall develop guidance for training and the day-to-day use of these procedures by the operator's employees. This guidance shall be contained in the operator's manual and the GACA may choose to provide it as a reference document for other GACA users. This guidance should not require GACA approval; but must include procedures about the automated recordkeeping system structure and instructions for using computer commands for such operations as data entry, data processing, data retrieval, and report generation. This manual should sufficiently address system security procedures and responsibilities to enable the operator to fully comply with all GACAR requirements. It should also identify individuals with the authority to issue user access codes and passwords.
- 5) The Inspector shall ensure that operators' programs contain audit procedures that are adequate to assure the accuracy of the database and compliance with GACAR requirements. The frequency and scope of these procedures should reflect the complexity of the electronic recordkeeping system and the size of the database.
- 6) Other types of signatures may also be acceptable to the GACA. An example of an acceptable form of a signature other than a written name is a mechanic's stamp. If a form of identification other than a handwritten signature is used, access to that identification should be limited to the named individual only. Access to individualized stamps or authentication codes should be limited to the user only. Although a signature may take many forms, the GACA emphasizes that use of all electronic entries must be approved and clearly indicated in OpSpec A25 when issued.

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**4.11.4.7. GRANTING ACCEPTANCE AND/OR APPROVAL.** When all requirements of subparagraphs 4.11.4.5 have been met, the Inspector may either grant acceptance for the entire computer-based recordkeeping system or any part of the system. When electronic signatures are employed, the Inspector shall grant approval through issuance of OpSpecs A25, and shall directly reference the manual where the information for electronic signature system procedures is maintained.

**4.11.4.9. SYSTEM SURVEILLANCE.** Inspectors are responsible for conducting system surveillance, which includes periodic inspections and audits, inspection intervals, and data entry accuracy.

**A. Inspections and Audits.** After the electronic recordkeeping system is accepted and fully operational, the Inspector shall ensure compliance through periodic inspections and audits. These inspections and audits shall be conducted using the same criteria as those used during the initial approval process. The Inspector should plan inspection intervals at least once every 12 months. The annual inspection should normally be conducted in conjunction with GACA surveillance program guidelines.

**B. Inspection Intervals.** When determining inspection intervals, the Inspector shall consider the following:

- The size of the database
- The system's overall complexity and sophistication level
- The extent of the system's security measures
- The capability and frequency of the systems self-audit function

**C. Scope of the Inspection.** The Inspector shall determine the scope of the inspection. It may be appropriate to sample a small number of records in each category that the system is approved to maintain, or to conduct an in-depth inspection of a specific category of records, such as aircraft dispatcher training.

**D. Data Entry Accuracy.** The Inspector shall ensure data entry accuracy during all inspections and audits. A useful evaluation tool might be to compare the operator's required records with GACA surveillance, inspection, and certification records.

**4.11.4.11. ADDITIONAL SYSTEM CAPABILITIES.** In addition to record retention and retrieval,

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the operator may request approval of a system with additional capabilities such as electronic communications and surveillance.

**A. Electronic Communications.** The operator may provide the Inspector with electronic mail capability which would allow the operator to request designation of certain crew members, such as check pilots. This capability would also allow the Inspector to respond electronically to these requests, thereby increasing both operator and GACA efficiency and convenience. To implement this electronic mail capability, the operator should provide the Inspector with system access and the necessary hardware to be installed at the Inspector's facility.

**B. Electronic Surveillance.** The operator may also provide direct access to the operator's electronic recordkeeping system to allow the Inspector to carry out required surveillance activities, such as random record retrieval for spot inspections, data audits, selective data retrievals, and reports or summaries. The operator should limit system access to those portions of the recordkeeping system that are used for data retrieval of records required by the GACARs. Normally, the Inspector should not be given access to data entry areas; however, the operator may authorize the Inspector access to data entry areas which pertain to GACA-specific data, such as observations of the pilot in command (PIC), OE, and observation events related to the designation of check pilots or aircrew-designated examiner candidates.

### 4.11.4.13. REFERENCES, FORMS, AND JOB AIDS.

**A. References:**

- GACAR Parts 121, 125, 133 and 135
- FAA Advisory Circular (AC) 120-78, Acceptance and Use of Electronic Signatures, Electronic Recordkeeping Systems, and Electronic Manuals.

**B. Forms.** None

**C. Job Aids.** None

### 4.11.4.15. Future Activities.

**A. Normal surveillance.**

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#### **CHAPTER 11. OPERATOR RECORDKEEPING FOR PARTS 121, 125, 133 AND 135**

##### **Section 5. Evaluate Maintenance Recordkeeping System for Part 121**

###### **4.11.5.1. GACA Activity Report (GAR).**

- A. 3302 (AW) (Initial Program)
- B. 3303 (AW) (Revisions)
- C. 3634 (AW) (Aircraft Records)

###### **4.11.5.3. OBJECTIVE.**

**A. Monitoring Operator Aircraft Maintenance Records.** This section provides information necessary for evaluating operator maintenance recordkeeping systems and other required records/reports on an initial and continuing compliance basis. Pertinent sections of the General Authority of Civil Aviation Regulations (GACARs) outline the requirement of an operator system for the preparation, storage, and retention of certain required records and reports. The primary objective of these systems is the generation, storage, retention, and retrieval of accurate and complete operator aircraft maintenance records that show that the Standard Certificate of Airworthiness of a particular aircraft is effective.

**NOTE:** The guidance in this section is also applicable to GACAR Part 135 operators who have elected to use a Continuous Airworthiness Maintenance Program (CAMP) under GACAR § 135.239(a)(2).

###### **4.11.5.5. GENERAL.**

**A. Standard Certificate of Airworthiness.** To remain effective, a Standard Certificate of Airworthiness issued to a Saudi Arabian-registered aircraft must be maintained according to the regulatory requirements. In view of this significant requirement, aircraft maintenance records become especially important, since incomplete or inaccurate required aircraft maintenance records can render a Standard Certificate of Airworthiness ineffective. Aircraft maintenance actions, in almost all cases, become intangible or abstract after the fact. Therefore, to make a maintenance

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action tangible, the aircraft operator makes a record of it. Also, making a record of certain summary information supports the current airworthiness status of an aircraft. These maintenance records are important to the GACA, as the GACA uses its continuing review of aircraft maintenance records as a direct means of determining properly done regular maintenance, preventative maintenance (PM), and alterations, thereby fulfilling, in part, its oversight mandate for the airworthiness and safety of aircraft.

**B. Non-Compliance.** Furthermore, because the review of maintenance records is the primary direct means of determining properly completed required maintenance, PM, and alterations, the GACA views intentionally failing to make or keep, to falsify, mutilate, conceal or induce reliance on a false statement, or to alter operator aircraft records as an critical non-compliance issue. Moreover, an operator's failure to make available any required record, document, or report can be grounds for suspending all or any part of its operator's operating certificate and operations specifications (OpSpecs). The GACA expects the operator to accurately produce, complete, and correct its records.

### 4.11.5.7. REQUIRED OPERATOR AIRCRAFT MAINTENANCE RECORDS.

**A. Retention Requirements.** Operator aircraft maintenance record making and retention requirements consist of a list of summary status information and maintenance records. Currently, the regulations require each operator to keep certain maintenance records as specified in GACAR § 121.699.

**B. Required Records.** Regulations require operators to make and keep a list of certain summary status records and records related to the issuance of an airworthiness release form, and to transfer that information with the aircraft when it is sold. These specific records are:

- 1) The total time in service of the airframe, each installed engine, and each installed propeller. Section 1.1 defines "time in service." Total time in service includes the time in service accrued since new or since rebuilt, expressed in hours and landings or cycles.
- 2) The current status of each life-limited part of each airframe, engine, propeller, and appliance means a record that contains at least the following information:
  - a) Time in service since new expressed in the appropriate parameter (hours, cycles, calendar-time, etc.).

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- b) The time in service remaining to the specified life limit expressed in the appropriate parameter (hours, cycles, calendar-time, etc.).
  - c) The specified life limit expressed in the appropriate parameter (hours, cycles, calendar-time, etc.).
  - d) A record of any action that alters the part's life limit or changes the parameter of the life limit.
- 3) The listing of the time since last overhaul means a record that contains at least the following information:

- a) A listing of the item requiring overhaul and its associated, scheduled overhaul interval.
- b) The time in service since the last overhaul.
- c) The time in service remaining to the next scheduled overhaul.
- d) The time in service when the next scheduled overhaul is due.

**NOTE:** The listing of time since overhaul (TSO) refers to current summary status information and must not be confused with an overhaul record. An overhaul record is a description of the work performed and the identification of the person who performed the work and/or issued the approval for return to service (RTS).

- 4) The current inspection status of the aircraft means a record that contains, at least, the following information:

- a) A listing identifying each of the scheduled inspection packages or groups, or individual tasks, and their associated intervals required by the maintenance program that maintains the aircraft.
- b) The time in service since the last inspections required by the inspection program under which the aircraft and its appliances are maintained.
- c) The time in service remaining to the next completion of each of the scheduled

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inspection packages or individual tasks groups required by the maintenance program that maintains the aircraft.

- d) The time in service when the next accomplishment of each of the scheduled inspection packages or groups, or individual tasks, required by the maintenance program that maintains the aircraft, is due.
- 5) The current status of an Airworthiness Directive (AD) means a record that contains, at least, the following information:
  - a) Identification of the particular airframe, engine, propeller, appliance, or component to which the AD is applicable.
  - b) The AD number (and/or regulatory amendment number).
  - c) The date and time in service, expressed in the appropriate, measuring parameter (hours, cycles, calendar-time, etc.), when the operator accomplished the required action.
  - d) If the requirement is recurring, the time in service when the next action is due, expressed in the appropriate measuring parameter (hours, cycles, calendar-time, etc.).
  - e) The method of compliance means a concise description of the action taken to comply with the requirements of the AD. If the AD or its referenced manufacturer's Service Bulletin (SB) permits the use of more than one method of compliance, the record must include a reference to the specific method of compliance used. If the operator uses an alternative method of compliance (AMOC) to comply with an AD, the method of compliance means a description of this AMOC and a copy of the GACA approval. The AMOC and a copy of the GACA approval are permanent parts of the method of compliance record. If the operator identifies its method of compliance as an internal procedure or document—such as an Engineering Order (EO), change order, engineering authorization, or similar document—to accomplish and document the AD accomplishment, the GACA considers a copy of that internal document a permanent part of the method of compliance record.

**NOTE:** The record of current status of an AD or method of compliance refers to summary current status information and must not be confused with an AD record of accomplishment, which is a description of the work performed and the identification of the person who

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performed the work and/or issued the approval for RTS.

6) A listing of the current major alterations of each airframe, engine, propeller, and appliance means a record that contains, at least, the following information:

- a) A listing identifying each major alteration and major repair, including the item associated with the major alteration or major repair.
- b) A description or reference to the GACA-approved technical data used to make the major alteration or major repair.

**NOTE:** The listing of all of the current major alterations refers to current summary status information and must not be confused with a major alteration record. A major alteration record is a detailed description of the work performed; a description of the GACA-approved technical data used to make the alteration, and the identification of the person who performed and/or issued the approval for RTS. This listing also must not be confused with the major alteration report, which must be submitted in accordance with GACAR § 121.1549.

7) While the regulatory requirement (for all the records necessary to show that all requirements for the issuance of an airworthiness release have been met) does not provide a detailed list of records that the operator must retain, this requirement generally means:

- a) Records of all scheduled maintenance that work of equivalent scope and detail has not superseded.
- b) For those items requiring overhaul, detailed records of the accomplishment of the last overhaul.

**NOTE:** Regulations do not require an overhaul record to contain a record of AD accomplishment. The regulations require the operator to make and preserve records of AD current status and accomplishment as a separate and distinct record.

- c) Records of all unscheduled maintenance that work of equivalent scope and detail has not superseded.
- d) Adequate copies of the maintenance log, covering the last 60 days of operation,

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required under GACAR §§ 121.1193 and 121.1541 and consistent with GACAR § 121 Subpart Q. Regulations require the operator to keep all of the above items and to transfer them to the purchaser when the aircraft is sold.

**4.11.5.9. OTHER REQUIRED RECORDS AND REPORTS.** GACAR Part 121 subpart Q outlines the reports and records required for operators to keep. The GACA also uses these reports in its continuous review of operator maintenance operations as a direct means of assessing the design, performance, and effectiveness of all elements of the operator maintenance program, as well as the Continuing Analysis and Surveillance System (CASS) (see GACAR §121.691).

**A. Operator Airworthiness Release.** Consistent with GACAR §§ 43.7, 43.9(e), or GACAR Part 121, Subpart Q, it is clear that an operator may not operate its aircraft after the accomplishment of any maintenance, PM, or alterations unless it has approved the aircraft for return-to-service (RTS).

1) An operator airworthiness release or a log entry is the operator's version of an approval for RTS. An operator may accomplish an approval for RTS with a log entry instead of an airworthiness release. Other than form or format, there is no legal or technical difference between an operator airworthiness release and an operator log entry. This is consistent with the requirements of GACAR §§ 43.7, 43.9(e), 43.11(b), and GACAR Part 121, Subpart Q.

2) The purpose of the airworthiness release or appropriate log entry (that is made after the accomplishment of any operator maintenance) is a certification that the aircraft is airworthy. In other words, the work was done according to the GACARs and the operator's instruction, and no known condition exists that would make the aircraft un-airworthy. The form of the airworthiness release is optional as long as it fulfills the purpose of the rule.

3) The four certifications are as follows:

- The work was performed in accordance with the requirements of the operator's manual
- An authorized person inspected all items requiring inspection and determined that the work was satisfactorily completed
- No known condition exists that would make the airplane un-airworthy
- Concerning the work performed, the aircraft is in condition for safe operation

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- 4) These four certifications are also consistent with requirements of regulations. There is only one approval for RTS certification and documentation. However, the operator may accomplish its execution in one of two manners: an aircraft log entry or an airworthiness release form. If the operator uses an airworthiness release form, it is separate and distinct from the aircraft log. Also, the operator does not include it in the maintenance records. If a separate airworthiness release form is used, the regulations require that a copy of the airworthiness release is given to the pilot in command (PIC) and that a record of the airworthiness release is kept for at least 2 months.
- 5) A review of standard practice shows that most operators do not use an airworthiness release form that is separate and distinct from the aircraft log. Most operators use a log entry labeled as an airworthiness release.
- 6) In a practical sense, instead of restating the four certifications each time a log entry or airworthiness release is made, most operators state in their manual that the signature in the aircraft log of an authorized appropriately certificated individual authorizes an approval for RTS and constitutes the four, regulatory certifications without restating the four certifications each time.
- 7) For the purposes of contract maintenance, it is important to note that GACAR Part 121, Subpart Q outlines specific requirements for the persons authorized to sign an airworthiness release or aircraft log entry. Thus, a repair station, as a company, qualifies as a “person” defined in GACAR § 1.1 and can prepare, or cause to be prepared, an airworthiness release or an appropriate entry in the aircraft log. Such a release or aircraft log entry is limited to the work the repair station is rated to perform and actually performs on an aircraft for certificate holders operating under GACAR Part 121. However, in preparing the airworthiness release or aircraft log entry, the person—or in this instance, the certificated Part 145 repair station—must comply with the procedures set forth in the Part 121 operator’s manual for preparing the airworthiness release or aircraft log entry. Since there is no reference to “person” in GACAR Part 121, Subpart Q, the “certificate holder” refers not to the repair station, but to the Part 121 operator for whom the repair station is performing maintenance. This provision corresponds to the Part 121 operator’s duty to ensure that not only are competent personnel performing maintenance on their fleets, but that each aircraft released to service is airworthy.
- 8) Finally, as a qualification requirement, each authorized individual must hold a mechanic’s

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certificate with appropriate ratings or an appropriate repairman's certificate. There is an exception for individuals employed by a certificated repair station (CRS) located outside the Kingdom of Saudi Arabia (KSA).

**B. Maintenance Log.** GACAR §§ 121.1193 and 121.1541 require an aircraft maintenance log. These sections require any person who takes action in response to a reported or observed failure or malfunction, to make a record of that action in the maintenance log of the aircraft. GACAR § 121.1193 requires the PIC to ensure that it has entered all mechanical irregularities occurring during flight time in the maintenance log at the end of that particular flight time.

**C. Service Difficulty Reports (SDR).** SDRs are required by GACAR §§ 121.1553 and 145.103. While the operator should use these reports to identify deficiencies within its operator maintenance program, they are also the primary means of gathering information for GACA analysis.

**D. Mechanical Interruption Summary (MIS).** These reports address the inability of the aircraft to arrive at its scheduled destination due to mechanical difficulties. GACAR § 121.1557 requires these documents. Analysis of the events in these reports is one of the operator's most effective means of determining the effectiveness of the Continuous Airworthiness Maintenance Programs (CAMP).

**E. Alteration and Repair Reports.** Regulations require a Part 121 operator to prepare a report of each major alteration and each major repair made on its aircraft promptly on their completion, as outlined in GACAR § 121.1549. While the regulations require an operator to submit a report of a major alteration to the GACA Principal Inspector (PI) assigned to the Part 121 operator, they do not require the operator to submit a report of a major repair. However, the operator must make it available for inspection by the PI. This is one of the required reports listed under GACAR § 119.107. In addition, GACAR § 43.11(b) permits an operator to use a form other than GACA Form: Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance), for reporting a major alteration or repair accomplished by it. The report, required by GACAR § 121.1549, should contain at least the identification of the altered airframe, aircraft engine, propeller, or appliance. The report should provide a means of positively identifying each altered item and its technical data approval basis.

**NOTE:** These alteration and repair reports should not be confused with the current status listing of major alterations and major repairs required under Part 121

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### **4.11.5.11. HISTORICAL AIRCRAFT MAINTENANCE RECORDS.**

**A. GACA Monitoring.** Aircraft maintenance records and current summary status information are the primary and most direct means the GACA and the operator have of determining the airworthiness status of aircraft. The importance of accurate operator aircraft maintenance records cannot be overstated. In view of the severe implications involved with falsification or alteration of required aircraft records, the GACA expects these current status information records to be complete as well as accurate.

**B. Recordkeeping.** The GACA's level of confidence in current status records produced by operator's maintenance recordkeeping system and monitored by that operator's CASS is clearly higher than it would be for those records produced by no system or by a system that the GACA does not monitor. Unless there is evidence to the contrary, an aircraft maintenance record, particularly a current status record, produced by an operator's maintenance recordkeeping system should be acceptable by itself (i.e., without historical or source records). The GACA should not require or force an aircraft operator to produce or keep records that a regulation does not require. For its aircraft maintenance recordkeeping system, the operator must develop and use detailed documentation and source requirements and procedures for administrative handling of aircraft components and parts. The operator must clearly identify these requirements and procedures in its manual. These source and documentation requirements may include, but are not limited to, documentation of AD compliance, life-limited parts current status information, description of maintenance performed, and appropriate certification of new and repaired parts.

**C. Essential Information.** To ensure that the operator satisfies these requirements, it should enter the following essential information into its recordkeeping system:

- 1) The documentation and source information required for operators to retain as necessary to support the CASS.
- 2) Documentation that may be necessary to integrate the part into the operator's CAMP.
- 3) Documentation required to support future maintenance on the affected parts, such as detailed shop records or approved technical data.

**D. Additional Records.** An operator may wish to archive certain source documentation records, which the operator used to introduce parts into their system. These may be such records as the manufacturer's invoice for new parts, export certificates of airworthiness, documentation of a

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major repair or alteration, or other similar information that the operator may consider useful in the future.

### **4.11.5.13. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Parts 43, 119 and 121
- FAA Advisory Circular (AC) 120-16, Air Operator Maintenance Programs.

#### **B. Forms.** GACA Activity Report (GAR).

#### **C. Job Aids.** None.

### **4.11.5.15. PROCEDURES.**

**A. Overview.** During initial certification, regulations require an operator to establish an aircraft maintenance recordkeeping system. The operator should base its system on safety principles which should achieve the highest levels of safety in its operations. It must also develop a section in its manual that provides a description of the system as well as detailed instructions for the use of that recordkeeping system. The recordkeeping system may be electronic. If so, the provisions of GACAR § 121.1567 must be met. The PI should ensure that the operator's manual contains a section that describes or presents an overview of the recordkeeping system. In addition, the operator's initial compliance statement should clearly identify the detailed procedures contained in the operator's manual to use for the generation, storage, retention, and retrieval of aircraft maintenance records. The section of the operator's manual that describes the maintenance recordkeeping procedures should be written in a consistent format and describe clear, concise, and accurate procedures. Ambiguities should not be accepted. After certification, the assigned GACA personnel should conduct surveillance of the operator's aircraft maintenance recordkeeping system on a routine basis to ensure that it is producing and maintaining accurate records, and that they are retrievable in accordance with the system.

**B. Record Location and Responsible Persons.** Consistent with GACAR § 119.107, verify that the operator has procedures in its manual for making required records available to the GACA at its principal base of operations. This should contain a current listing that includes the location of the records and those persons who are responsible for each record, document, and report

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required to be kept by the operator; as well as each employee of, or person used by, the operator who is responsible for maintaining the operator's maintenance records.

**C. System Evaluation.** Evaluate the aircraft maintenance reporting and recordkeeping system described in the operator's manual. The reporting and recordkeeping system must include the procedures, information, and instructions necessary to allow the personnel concerned to perform their duties and responsibilities with a high degree of safety. The manual should identify the individual with overall authority and responsibility for the recordkeeping system as well as the individual who has direct responsibility for each system function. The general regulatory requirements for an operator maintenance recordkeeping system are that the system must be suitable, that the system must provide for the preservation and retrieval of information in a manner acceptable to the GACA, and that, with regard to maintenance work performed, the system includes procedures that ensure that maintenance work records include, at least:

- 1) A description (or reference to data acceptable to the GACA) of the work performed.
- 2) The name of the person performing the work if the person is from outside the organization of the operator.
- 3) The name or other positive identification of the individual approving the work. The system should address both types of aircraft maintenance records (i.e., records to show that all requirements for the issuance of an airworthiness release have been met and the record of current summary status information).

**D. Procedures Review.** While reviewing the operator's maintenance manual, keep in mind that although each operator's maintenance recordkeeping system must meet the same requirements, the system and procedures developed and used by each individual operator to meet those requirements may be quite different from one another. The system may be electronic. Also, keep in mind that the recordkeeping procedures must address the generation, storage, retention, and retrieval of records of all maintenance and alterations, whether operator personnel or authorized persons outside of the operator's organization accomplish the maintenance or alteration. They are not maintenance provider records, even if a CRS accomplished the work. The procedures must clearly identify the particular individual(s), by job title or description, which has the authority and responsibility for each particular function of the recordkeeping system. In addition, the operator's maintenance recordkeeping procedures must not be contrary to the regulations, nor should the manual contain procedures which permit activity that results in de facto exemptions

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from sections of the GACARs. An operator maintenance recordkeeping system must include, at least, methods and detailed procedures for the generation, storage, retention, and retrieval of:

- 1) Records of scheduled, unscheduled, and shop maintenance.
- 2) Records of engine and/or propeller or rotor shop maintenance
- 3) Records of the maintenance log entry or airworthiness release described in GACAR Part 121, Subpart Q.
- 4) If the operator uses an airworthiness release form, all records necessary to show that all requirements for the issuance of the airworthiness release form described in GACAR Part 121, Subpart Q have been met.
- 5) The SDRs.
- 6) MIS reports.
- 7) The report of each major alteration and repair of each airframe, aircraft engine, propeller, or appliance of an aircraft operated by the operator.
- 8) The current summary status information, describing:
  - a) The total time in service of the airframe, each engine, and each propeller.
  - b) The current status of each life-limited part of each airframe, engine, propeller, and appliance.
  - c) The time since overhaul of each item requiring overhaul.
  - d) The current inspection status of the aircraft.
  - e) The current status of each applicable AD.
  - f) A list of the current major alterations and major repairs to each airframe, aircraft engine, propeller, or appliance.

**E. Analyze the Findings.** Evaluate all findings to determine if they require corrective action and

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initiate them.

### **4.11.5.17. TASK OUTCOMES.**

#### **A. Complete the GACA Activity Report (GAR).**

**B. Document the Task.** Document all task(s) consistent with current policy. Successful completion of this task should result in a finding that the operator's recordkeeping system or revision is acceptable to the GACA, and/or a finding that the operator's recordkeeping system is performing properly and is producing the desired results.

- A letter to the applicant outlining the results of evaluation
- Continuation/completion of the certification process, if applicable

### **4.11.5.19. FUTURE ACTIVITIES.**

#### **A. Normal surveillance.**

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#### **CHAPTER 11. OPERATOR RECORDKEEPING FOR PARTS 121, 125, 133 AND 135**

##### **Section 6. Evaluate Maintenance Records for Part 125**

###### **4.11.6.1. GACA ACTIVITY REPORT (GAR).**

A. 3634 (AW)

**4.11.6.3. OBJECTIVE.** This section describes the process used to evaluate an applicant's procedures for using, preserving, and retrieving the maintenance records required by General Authority of Civil Aviation Regulations (GACAR) Part 125.

**4.11.6.5. GENERAL.** To comply with the maintenance recording requirements of the GACARs, a GACAR Part 125 operator's Maintenance Manual (MM) must identify and contain procedures to complete all applicable documents as specified in GACAR Parts 91 and 125.

**A. Current Airworthiness Directive Status.** The operator must keep a record showing the current status of applicable Airworthiness Directives, including the method of compliance.

1) This record must include the following:

- List of Airworthiness Directives with revision dates applicable to the type of aircraft
- The method of compliance
- The time in service, or the cycles, and/or the calendar date when the next action is required for a recurring Airworthiness Directive

2) An acceptable method of compliance should include a reference to one of the following:

- A specific portion of the Airworthiness Directive
- A manufacturer's service bulletin, if the bulletin is referenced in the Airworthiness Directive

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- Another document generated by the person performing the maintenance that shows compliance with the Airworthiness Directive, such as an Engineering Order (EO) or Engineering Authorization (EA)

**NOTE:** Alternative methods of compliance must be approved by the General Authority of Civil Aviation (GACA) and will apply only to the applicant making the application.

3) The document that contains the current status of Airworthiness Directives/method of compliance may be the same as the record of Airworthiness Directive accomplishment. Both the record of Airworthiness Directive accomplishment and the record of Airworthiness Directive method of compliance must be retained with the aircraft records.

### **B. Total Time-in-Service Records.**

1) GACAR Part 125, through the applicable requirements of GACAR Part 91, requires the total time-in-service records for airframes, engines, and when applicable, propellers. Total time-in-service records may consist of the following:

- Aircraft maintenance record pages
- Designated cards or pages
- A computer listing
- Other methods as described in the applicant's MM

2) Required total time-in-service records must be retained with the aircraft records. If the airplane is sold, the records must be transferred to the purchaser.

### **C. Life-limited Parts Status Records.** Records must be kept for components of the airframe, engine, propellers, and appliances that are identified to be removed from service when their life limit has been reached.

1) The current life-limited status of the part is a record indicating the life limit remaining before the required retirement time of the component is reached. This record must include any modification of the part as directed by Airworthiness Directives, service bulletins, or manufacturer/applicant initiated product improvements.

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2) The following are not considered a current life-limited status record:

- Work orders
- Maintenance installation records
- Purchase requests
- Sales receipts
- Manufacturer's documentation of original certification
- Other historical data

3) Whenever the current status of life-limited parts records cannot be established and the historical records are not available, the airworthiness of that product cannot be determined and it must be removed from service.

4) Current status of life-limited parts records must be retained with the airplane indefinitely. If the airplane is sold, the records must be transferred to the purchaser.

**D. Airworthiness Release/Approval for Return to Service.** After performance of maintenance, preventive maintenance, or alterations on an airplane, an airworthiness release or an approval for return to service must be completed before the aircraft is operated.

1) Using the procedures described in the MM, the applicant must be able to retain all the records necessary to show that all requirements for approving the aircraft for return to service have been met.

2) As applicable, the operator must identify the following:

- Those persons authorized to perform inspections
- Those persons authorized to sign an airworthiness release

3) These personnel must be appropriately certificated as required by GACAR Part 43.

### **E. Overhaul Records.**

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1) A record must be made whenever an item of aircraft equipment is overhauled and must include the following:

- A description of the work performed or reference to data acceptable to the President
- The name of the person performing the work
- The date of completion of the work performed
- The signature and certificate number of the individual approving the aircraft for return to service

**NOTE:** A return to service tag does not constitute an overhaul record, although it may be used to reference the overhaul records.

2) The operator must retain the record and be able to make it available to the General Authority of Civil Aviation (GACA) upon demand. The overhaul records must be retained until the work is repeated or superseded by work of equal scope and detail.

**F. Current Airplane Inspection Status.** The operator must retain a record identifying the current inspection status of each aircraft.

1) This record shall show the time in service since the last inspection required by the inspection program under which the aircraft, engines, emergency equipment, propellers, and appliances are maintained.

2) Records of inspection work packages or routine and non-routine items generated while performing any part of the inspection program must be retained until the work is repeated or superseded by work of equal scope and detail.

**G. Major Repair and Major Alteration Records.** Applicants must retain the records for each major repair/alteration made to an aircraft, including work done on the following:

- Airframe
- Engine

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- Propeller

- Appliance

- 1) Major repair records must be retained for 1 year after accomplishing the work or until the work is repeated or superseded by other work.
- 2) Major alteration records must be retained with the airplane indefinitely. If the airplane is sold, the records must be transferred to the purchaser.

### **4.11.6.7. PREREQUISITES AND COORDINATION REQUIREMENTS.**

#### **A. Prerequisites.**

- Knowledge of the regulatory requirements of GACAR Parts 91 and 125

#### **B. Coordination.** This task requires coordination with the applicant.

### **4.11.6.9. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References.**

- GACAR Parts 43, 66, and 145
- Operator's Maintenance Manual

#### **B. Forms.** GAR.

#### **C. Job Aids.** None.

### **4.11.6.11. PROCEDURES.**

#### **A. Review Recordkeeping Procedures in the Operator's MM.**

- 1) Ensure that procedures exist in the operator's MM that creates a suitable system for initiating, preserving, and retrieving the required records.
- 2) Ensure that all records will contain the following information, as applicable:

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- Description of the work performed (or reference to data acceptable to the GACA)
- The name of the person performing the work with that person's certificate type and number
- The name of the person approving the work with that person's certificate type and number

**B. Review the Operator's Recordkeeping System.** Review the operator's recordkeeping system to ensure that the requirements of Parts 91 and 125 will be met for the following:

1) *Airworthiness releases/approval for return to service records.* Ensure the following:

- Record requirements of GACAR § 125.541 will be met
- Approval for return to service records will be retained for one year after the work is performed or until repeated or superseded by other work
- Airworthiness releases will be retained for at least 60 days

2) *Total time-in-service records.*

- Evaluate the method of recording total time in service of the airframe, engine, and propeller.
- Ensure that procedures are in place to retain the records with the airplane indefinitely. If the aircraft is sold, the records must be transferred to the purchaser.

3) *Life-limited Parts Status.*

- Ensure that the operator has procedures for tracking the current status of life-limited parts for each airframe, engine, propeller, and appliance, to include the following information:
  - Total operating hours (including calendar time)/cycles accumulated
  - Life limit (total service life)

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- Remaining time/cycles
  - Modifications
- b) Ensure that procedures are in place to retain the records with the aircraft indefinitely.  
If the aircraft is sold, the records must be transferred to the purchaser.
- 4) *Time Since Last Overhaul Records.* Ensure that procedures exist for updating this document from the overhaul records and for ensuring that this document accompanies the aircraft upon sale.
- 5) *Overhaul Records.*
- a) Ensure that the manual describes how the operator will document the last complete overhaul of each airframe, engine, propeller, and appliance. The overhaul record should include the following information:
- Disassembly data
  - Dimensional check data
  - Replacement parts list
  - Repair data
  - Reassembly/test data
  - Reference to data including overhaul specifications
- b) Ensure that these records will be retained until the work is repeated or superseded by work of equivalent scope and detail.
- 6) *Current Aircraft Inspection Status.*
- a) Evaluate the method the operator will use to record the time in service since the last inspection.
- b) Ensure that procedures are in place to retain the records with the aircraft indefinitely.

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If the aircraft is sold, the records must be transferred to the purchaser.

7) *Airworthiness Directive Compliance.* Evaluate how the operator will comply with the recordkeeping requirements of the Airworthiness Directives, including emergency Airworthiness Directives. The procedures must generate a record that contains the following data:

a) Current status. Ensure that the current status data will include the following:

- A complete list of Airworthiness Directives applicable to the aircraft
- The date and time of compliance
- The time and/or date of the next required action (if a recurring Airworthiness Directive)

b) Method of compliance. Ensure that this data will include either a record of the work performed or a reference to the applicable section of the Airworthiness Directive.

**NOTE:** Ensure that the records will be retained with the aircraft indefinitely. If the aircraft is sold, the records must be transferred to the purchaser.

8) *Major Repair Records.* Ensure that the operator will prepare and maintain a record for each major repair to an airframe, engine, propeller, or appliance.

a) Ensure that this record will include the following information:

- A description of the work performed
- The GACA-approved data used to perform the work
- The date of completion of the work performed
- The signature and certificate number of the person approving the aircraft for return to service

b) Ensure that these records will be retained until the work is repeated or superseded, or for one year after the work is performed.

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9) *Major alteration records.* Ensure that the operator will prepare and maintain a record for each major alteration to an airframe, engine, propeller, or appliance.

a) Ensure that this record will include the following information:

- A description of the work performed or data acceptable to the GACA
- The date of completion of the work performed
- The signature, type of certificate, and certificate number of the person approving the aircraft for return to service

b) Ensure that these records will be retained with the aircraft indefinitely. If the aircraft is sold, the records must be transferred to the purchaser.

**C. Analyze the Findings.** Evaluate all deficiencies to determine if corrective actions will be required.

### 4.11.6.13. TASK OUTCOMES.

**A. GAR.** Complete and file the GAR.

**B. Task Completion.** Successful completion of this task will result in the following:

- A letter to the operator confirming the results of inspection
- Continuation of the certification process, if applicable
- Follow-up inspection for a particular discrepancy

**C. Task Documentation.** File all supporting paperwork in the operator's office file.

### 4.11.6.15. FUTURE ACTIVITIES.

Schedule follow-up inspections as required.

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#### **CHAPTER 11. OPERATOR RECORDKEEPING FOR PARTS 121, 125, 133 AND 135**

##### **Section 7. Evaluate Maintenance Records for Part 135**

###### **4.11.7.1. GACA Activity Report (GAR).**

- A. 3302 (AW) (Initial Program)
- B. 3303 (AW) (Revisions)
- C. 3634 (AW) (Aircraft Records)

**4.11.7.3. OBJECTIVE.** This section provides guidance to ensure that the General Authority of Civil Aviation Regulations (GACAR) Part 135 operator creates, preserves, and retrieves the required maintenance records.

**NOTE:** The guidance in Section 5 is applicable to GACAR Part 135 operators who have elected to use a Continuous Airworthiness Maintenance Program (CAMP) under GACAR § 135.239(a)(2).

###### **4.11.7.5. GENERAL.**

**A. Document Completion Assurance.** To comply with the maintenance recording requirements of the regulations, the operator's maintenance manual must identify and contain procedures that ensure that it has completed all applicable documents in use.

**B. Maintenance Recordkeeping Requirements.** GACAR § 91.457 details maintenance recordkeeping requirements for the following:

- 1) Current status of applicable Airworthiness Directives (AD), including the date and method of compliance, recurring AD actions, and the time and date when the next action is required.
- 2) Maintain total time in service records for airframe, engines, propellers, and rotors.

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- 3) Current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance.
- 4) Time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis.
- 5) Current inspection status of the aircraft, including the time since the last inspection required by the aircraft inspection program under which the aircraft and its appliances are maintained.
- 6) Copies of the forms prescribed by GACAR § 43.11(a) for each major alteration and major repair to the airframe and currently installed engines, rotors, propellers, and appliances.

**C. Procedures for Document Completion.** To comply with the maintenance recording requirements, the operator's maintenance manual (MM), as defined in GACAR § 135.85 must identify and contain procedures to complete all applicable documents as specified in Part 91 and 135.

**D. Procedures for Recordkeeping.** The MM should contain procedures for the recordkeeping system. The procedures should address the following requirements of the regulations:

- 1) The total time in service record may consist of aircraft maintenance record pages, separate cards or pages, a computer list, or other methods as described in the operator's manual (GACAR § 91.457(a)(2)(i)).
- 2) Life-limited parts (e.g., components of the airframe, engine, propellers, rotors, and appliances) are identified for removal from service when they have reached a specific time limit or number of cycles (GACAR § 91.417(a)(2)(ii)).
  - a) The current status of the part is a record indicating the operating time limits, total number of hours or accumulated cycles, and the number of hours or cycles remaining before the component reaches its required retirement time. This record must also include any modification of the part in accordance with ADs, Service Bulletins (SB), or product improvements by the manufacturer or operator/applicant.
  - b) The General Authority of Civil Aviation (GACA) does not consider the following to be current status records:

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- Work orders
  - Maintenance installation records
  - Purchase requests
  - Sales receipts
  - Manufacturers documentation of original certification
  - Other historical data
- c) Whenever an operator cannot establish the current status of a life-limited part, that part should be considered un-airworthy and must be removed from service.
- 3) The operations specifications (OpSpecs), or a document referenced in the OpSpecs list items requiring overhaul.
- a) The overhaul list includes the actual time or cycles in service since the last overhaul of all items installed on the aircraft.
  - b) The overhaul list refers to the time since the last overhaul of an item. Do not confuse the list with an overhaul record. An overhaul record requires a description of the work and identification of the person who performed and/or approved the work.
- 4) The person must make a record whenever they overhaul(s) an item of aircraft equipment. This overhaul record must describe the work performed. The operator must have this record or be able to make it available to the GACA.
- 5) GACAR § 91.457 requires the operator to retain a record identifying the current inspection status of each aircraft.
- a) The record must show the time in service since the last inspection required by the inspection program, under which the person maintains the aircraft and its appliances.
  - b) The operator must retain inspection work packages or routine and non-routine items generated while performing any part of the inspection program for 1 year after

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performing the work or until other work repeats or supersedes it.

6) GACAR § 91.457(a)(2)(v) requires the operator to keep a record showing the current status of applicable ADs, including the method of compliance.

a) This record for Part 91 and 135 must include the following:

- The AD number and revision date
- List of ADs applicable to the aircraft
- The date and time in service or cycles, as applicable
- Method of compliance
- The time in service or cycles and/or date when the next action is required (if it is a recurring AD)

b) An acceptable method of compliance may be one of the following:

- Reference to a particular portion of the AD
- Reference to a manufacturer's SB if the AD references the bulletin
- Reference to any other document generated by the operator that shows compliance with the AD

c) The operator's MM must have procedures to comply with new and emergency ADs to ensure completion of the action within the given time limits. This must include procedures for notifying the responsible individuals to implement the required action during other than routine duty hours.

d) Serious problems have surfaced during routine inspections when the applicable AD current status and method of compliance was not complete. When the operator cannot determine current status and method of AD compliance from the document, they must verify this compliance through either visual inspection or detailed records review.

7) The operator must accomplish all alterations and repairs by using GACA-approved data.

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Previous inspections have identified lack of approved data to support alterations. Operators are required to retain records of each major alteration to the following:

- Airframe
- Engine
- Propeller
- Rotor
- Appliance

8) The operator must retain major repair records for 1 year after accomplishing the work or until the work is repeated or superseded by other work.

9) Major alteration records must be retained with the airplane indefinitely. If the person sells the airplane, he must transfer the records to the purchaser.

**4.11.7.7. COORDINATION REQUIREMENTS.** This task requires coordination between the aviation safety inspector (Inspector) and the operator.

### **4.11.7.9. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Part 43, 65, 91 and 135
- Operator maintenance records
- Operators' maintenance manual

#### **B. Forms.** GACA Activity Report (GAR).

#### **C. Job Aids.** None.

### **4.11.7.11. PROCEDURES.**

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**A. Review Office Files.** Review the historical data of the operator's recordkeeping system. This includes the GAR history of past inspections, compliance enforcement, and any other applicable office files.

**B. Review the Operator's Maintenance Records .** Analyze the operator's recordkeeping system. Determine if the regulations' recordkeeping requirements are met. The recordkeeping should provide an acceptable method for creating, preserving, and retrieving required records. All records must contain the following:

- Description of the work performed (or reference to data acceptable to the GACA)
- The date of completion of the work performed
- The signature and certificate number of the person approving the aircraft for return to service (RTS)

1) *Airworthiness Records.* Ensure that the records as described in GACAR § 91.457(a)(1) are retained for 1 year after the work is performed or until repeated or superseded by other work.

2) *Total Time in Service.*

- a) Determine the method of recording total time in service of the airframe, engine, propeller, and rotor. This record must show the current time in service appropriate parameter.
- b) Determine if this record is retained until the aircraft is sold and is transferred with the aircraft upon sale.

3) *Status of Life-Limited Parts.*

- a) Ensure that the operator is tracking the current status of life-limited parts for each airframe, engine, propeller, rotor, and appliance.
- b) Determine if this record is retained until the aircraft is sold and is transferred with the aircraft upon sale.

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4) *Time Since Last Overhaul of All Items Required to be Overhauled.* This document must accompany the aircraft when transferred.

5) *Overhaul Records.* Ensure that the manual describes how the operator documents the last complete overhaul of each engine, propeller, and rotor. The overhaul records should be retained until the work is superseded by work of equivalent scope and detail. The overhaul record may include:

- Disassembly data
- Dimensional check data
- Replacement parts list
- Repair data
- Reassembly/test data
- Reference to data including overhaul specifications

6) *Current Aircraft Inspection Status.*

- a) Determine how the operator records the time in service since the last inspection.
- b) Determine if procedures ensure that this record is retained until the aircraft is sold and is transferred with the aircraft upon sale.

7) *AD Compliance.* Determine how the operator complies with recordkeeping requirements of the ADs, including emergency ADs. Ensure that there is a record containing the following items:

- a) Current Status.
  - The AD number and revision date
  - A list of all ADs applicable to the aircraft
  - Date and time of compliance

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- Time and/or date of next required action (if it is a recurring AD)
  - b) Method of Compliance. This includes either a record of the work performed or reference to the applicable section of the AD.
  - c) Determine if this record is retained until the aircraft is sold and is transferred with the aircraft upon sale.
- 8) *Major Alteration Records.* Determine how the operator maintains the records of major alterations to each airframe, engine, propeller, rotor, and appliance.

### C. Inspect the Operator Record System.

1) Identify the documents/forms that are used for ensuring that the following are accomplished:

- Total time in service
- Status of life-limited parts
- Time since last overhaul document
- Overhaul records
- Current aircraft inspection status
- Current status of applicable ADs
- Major alteration records

2) Inspect the records and, during the inspection, document and photocopy any confusing areas, obvious omissions, or apparent discrepancies.

- a) Compare the records with the actual accomplishment of the maintenance.
- b) Obtain and review the maintenance logs to determine the scheduled inspections and non-routine maintenance.

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c) Review maintenance records to ensure that:

- Flight discrepancies were entered at the end of each flight
- Corrective action was related to the discrepancy
- Corrective action and sign off are entered into the maintenance record
- Repetitive discrepancies are handled properly
- Deferred maintenance as authorized by the minimum equipment list (MEL) is deferred according to the operator's MEL and instructions

3) Select or obtain work packages for scheduled inspections and ensure that scheduled inspections are properly signed off.

a) Ensure that non-routine items generated were properly signed off.

b) Determine if repairs were categorized correctly (major or minor) and if approved data was used for major repairs.

4) Compare the actual record of accomplishment with the total time/cycles in service record for the airframe, engine, propeller, and rotor.

5) Select and obtain total time/cycles in service record for a sample number of aircraft to ensure that cumulative flight times/cycles are added to the record.

6) Make a spot check of the cumulative total time/cycle in service against the flight logs to ensure that daily entries correspond to the flight log.

7) If the operator maintains a hand-written maintenance record for engines, compare the record entries to the aircraft flight log entries for accuracy and to detect transposition of flight time/cycles in service, numbers, etc.

8) Compare the manual procedures for life-limited parts with the actual recording of the current status of life-limited parts.

9) Select a random sample of records and ensure that:

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- a) All life-limited parts described in the aircraft-approved limitations are noted.
  - b) Current status of each part is provided to include:
    - Total operating hours (including calendar time)/cycles accumulated
    - Life limit (total service life)
    - Remaining time/cycles
    - Modifications
  - c) Ensure that:
    - Time/cycles limits on the operator list are the same as those in the approved aircraft limitations
    - Life limits have not been exceeded
  - d) Select a sample of life-limited items that have been installed within the last 12 months and review records to ensure that life-limited time was carried forward from the previous service record.
  - e) If overhauled, ensure that the time since overhaul (TSO) record is available.
  - f) Ensure that the life limit of an item has not been changed as a result of the overhaul.
- 10) Compare the overhaul list with the actual record.
- 11) Identify items in the operator maintenance program that have overhaul requirements, if applicable.
- 12) Ensure that all items identified are on the current list.
- 13) Ensure that the overhaul list contains the time/cycles since last overhaul.
- 14) Ensure that the items on the list have not exceeded their specified overhaul time/cycle

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limits.

15) Select a random sample of items from the overhaul list to:

- a) Ensure that the records contain a description of the overhaul, and that the item was overhauled according to the overhaul specifications by a qualified and authorized person.
- b) Ensure the component was approved for RTS by an authorized person.

16) Review the removal/installation records of overhauled components to determine if the overhaul was accomplished within the authorized time limits.

- a) Compare the current aircraft inspection status with the record available.
- b) Determine whether daily flight hours/cycles are recorded to obtain the current inspection status.
- c) Take a random sample of aircraft inspection records and review the last two “C” checks (or equivalent) to ensure that scheduled inspections times/cycles were not exceeded (overflown).

17) Compare the compliance with ADs with the current status of the AD document.

- a) Contact the person responsible for AD records and request a random sample of aircraft AD compliance record.
- b) Ensure that the document contains all applicable ADs for the sampled aircraft.
- c) Ensure that the AD requirements were accomplished within the effective times of the AD, with special emphasis on recurring ADs.
- d) Ensure that the AD document contains current status and method of compliance. The current status must include these three items:
  - A list of all ADs applicable to the aircraft
  - Date and time of compliance

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- Time and/or date of next required action (if it is a recurring AD)
- e) Ensure that the list is being retained indefinitely.
- f) Identify those ADs with AMOCs, and ensure that the operator has obtained prior approval for that alternate method.
- g) Select from the current AD compliance document a number of ADs accomplished within the last 12 months and ensure that the appropriate accomplishment records are available. Review the accomplishment record to ensure the following:
- The method of compliance is as specified in the AD
  - The date of compliance is identical to the date on the current status list
  - The mechanic is certificated to accomplish the work
  - The accomplishment was properly signed off
- 18) Compare the major alteration and repair records with the actual records.
- a) Major Alterations:
- Request a list of all major alterations for a random sample of aircraft
  - Ensure that the list contains the date of accomplishment and a brief description of the alteration
  - Select a random sample of major alterations accomplished within the last 12 months and ensure that the respective maintenance records show that alterations were accomplished according to approved data
- b) Major Repairs:
- Request several records of major repairs, if available
  - Ensure that the records contain the date of accomplishment and a brief description

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of the repair. The respective maintenance records must also show that repairs were accomplished according to approved data.

- When major repairs or alterations are identified and are not recorded, request the actual maintenance accomplishment record from the operator

### D. Analyze the Inspection Results.

1) Determine the effectiveness of the maintenance recordkeeping system. Ineffective recordkeeping systems may be the result of:

- Inadequate/nonexistent procedures
- Not following manual procedures
- Ineffective organization
- Lack of qualified personnel
- Poor scheduling of AD compliance, overhaul requirements, inspections, etc.
- Improper training

2) Compile deficiencies.

- a) Compile all findings that are contrary to the regulations.
- b) Compile all findings that are in noncompliance, but are producing satisfactory results.

3) After compiling all findings and before the operator debriefing, consult with the appropriate supervisory personnel to determine which (if any) findings require enforcement actions.

4) If no findings are made, no further action is required.

### E. Meet with the Operator.

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1) Discuss the following items:

- All discrepancies discovered during the inspection
- Possible corrective action
- Possible enforcement actions

2) Inform the operator that official written notification of findings may follow.

### **4.11.7.13. TASK OUTCOMES.**

#### **A. Complete the GAR.**

**B. Complete the Task.** Completion of this task may result in the following:

- Formal letter to the operator confirming results of the review or inspection
- Continuation of the certification process, if applicable
- Follow-up inspection for a particular discrepancy

**C. Document the Task.** File record of inspection in operator's file in GACA office according to office procedures.

### **4.11.7.15. FUTURE ACTIVITIES.** Schedule follow-up inspections, as required, and conduct normal surveillance.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 1. Background and Definitions**

**4.12.1.1. INTRODUCTION.** This chapter contains direction and guidance to be used by aviation safety inspectors (Inspectors) for processing, reviewing and accepting or approving manuals, procedures, and checklists required to be produced by air operators operating under the General Authority of Civil Aviation Regulations (GACARs).

- Section 1 contains general background information and definitions of the terms used in this chapter
- Section 2 contains guidance for approving or accepting an operator's manuals, and checklists
- Section 3 contains guidance for the review and evaluation of a Flight Manual
- Section 4 contains guidance for the review and evaluation of an Operations Manual (OM)
- Section 5 contains guidance for the evaluation of a Maintenance Manual (MM)
- Section 6 contains guidance for evaluating a Maintenance Manual/Revision for Part 135
- Section 7 contains guidance for evaluating a Maintenance Manual/Revision for Part 121
- Section 8 contains guidance for evaluating Aircraft Checklists for Parts 121, 125, 133 and 135
- Section 9 contains guidance for the evaluation of Cabin Crew Member Manuals (CCMM) and Checklists
- Section 10 contains guidance for the review of an operator's Mechanical Interruption Summary Report for Parts 121 and 135

**NOTE:** Commercial air operators operating under GACAR Part 121 and 135 are required under GACAR Part 5 to implement a flight safety document system. GACAR Part 5, Appendix A and Attachment G of ICAO Annex 6, Part I provides additional information on

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the required flight safety document system for these operators.

**4.12.1.3. OVERVIEW OF MANUAL REQUIREMENTS.** The General Authority of Civil Aviation Regulations (GACARs) require operators to prepare and keep current various manuals and checklists for the direction and guidance of flight and ground personnel.

**A. Flight Manual.** GACAR § 91.303(c)(20) requires that a General Authority of Civil Aviation (GACA) approved flight manual (or equivalent) be carried aboard each aircraft for the guidance of crew members when conducting flight operations. A flight manual is any manual approved by the GACA that an operator uses to comply with this requirement. A flight manual may be an approved Aircraft Flight Manual (AFM) (the general term AFM includes an Airplane Flight Manual or a Rotorcraft Flight Manual (RFM)), or a Company Flight Manual (CFM) approved under GACAR §§ 121.147, and 125.83 (see paragraph 4.12.1.5, below, for definitions). For aircraft certificated by the Federal Aviation Administration (FAA), the AFM or RFM approved by the FAA during the certification process and subsequently accepted by GACA under GACAR Part 21 will meet those requirements. If an operator carries a CFM aboard the aircraft, that operator is not required to carry an AFM in addition to the CFM.

**B. Manuals.** GACAR §§ 121.139, 125.77, 133.61 and 135.83 require that each operator prepare and keep current manual(s) providing guidance for all categories of flight and ground personnel. This requirement does not apply to those operators granted a special authorization from this requirement by paragraph A5 of the operations specifications (OpSpecs). The operator's manual(s) must include the duties and responsibilities of each category of employee. The manual(s) must also include adequate policy, direction, and guidance for the safe and efficient performance of the duties assigned to each category of employee. Although the GACARs prescribe specific kinds of required manuals (e.g. Operations Manual, Maintenance Manual, etc.), in practice, however, a system of manuals is usually necessary, even for relatively simple operations. Operators have reasonably wide latitude in structuring their manuals.

**4.12.1.5. DEFINITIONS.** The following terms are defined according to their use in this handbook:

**A. Manual.** A Manual is a collection of the information, policies, procedures, and guidance prepared by an operator to instruct company employees in the performance of their assigned duties.

**B. Operations Manual (OM).** The Operations Manual is a manual that applies to flight operational activities as opposed to airworthiness activities. The OM is one of two major

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segments of an operator's flight safety document system.

**C. Maintenance Manual (MM).** That segment of an operator's manual system that pertains to the airworthiness of aircraft. The MM is one of two major segments of an operator's flight safety document system

**D. Flight Safety Document System.** A set of interrelated documentation established by the operator, compiling and organizing information necessary for flight and ground operations, and comprising, as a minimum, the operator's operations manual and the maintenance manual.

**E. User Manual.** A User Manual may be a segment of an OM or a MM that provides instruction, policies, procedures, and guidance to a specific category of employee. Examples of user manuals that are commonly used in the air transportation industry include the following:

- Flight operations policy manuals (FOPM)
- Aerodrome analysis or data manuals
- Security manuals
- Cabin Crew Member Manual (CCMM) or cabin service manuals
- Flight dispatch manuals
- Station operations manuals
- Route and aerodrome manuals
- Dangerous Goods, transportation and handling manuals

**NOTE:** The user manual titles previously listed are only examples of common titles currently in use in industry. Inspectors should not interpret this as a list of required titles. Operators may choose to organize their user manuals in any convenient way and may select different user manual titles.

**F. Aircraft Flight Manual (AFM).** An aircraft flight manual is prepared by the manufacturer and approved at the time of type certification under GACAR Part 21 or equivalent foreign rules (e.g.,

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approved by the FAA under the provisions of 14 CFR part 21, § 21.5).

**G. Company Flight Manual (CFM).** An aircraft flight manual that is developed by, or for, a specific operator for a specific aircraft type and that is approved by the principal operations inspector (POI). Companies may refer to their CFM by other names such as, Flight Crew Operating Manual (FCOM). OpSpec A7 lists those items within a manual that are specifically approved by the President. Other material within that manual may be accepted by GACA.

**H. Policy.** A written requirement established by an operator's management for compliance by appropriate personnel. A policy may be within a procedure or stated separately. A written requirement such as "No flight may depart on a cross-country flight without a spare case of oil" is an example of a policy.

**I. Recommendation.** A preferred technique or action described by the operator that employees are expected to follow whenever practical. A recommendation is not a policy requirement.

**J. Procedure.** A procedure is a logical progression of actions and/or decisions in a fixed sequence that is prescribed by an operator to achieve a specified objective. In short, a procedure is step-by-step guidance on how to do something. Procedures and Standard Operating Procedures (SOPs) have the same meaning under the GACAR and in this handbook.

**K. Abbreviated Procedure.** An abbreviated procedure is a list of sequential procedural steps without an amplified description or amplified set of instructions.

**L. Amplified Procedure.** An amplified procedure is a description of sequential procedural steps with detailed explanatory descriptions and/or instructions accompanying each step.

**M. Technique.** A technique is a method of accomplishing a procedural step or maneuver.

**N. Checklist.** A formal list used to identify, schedule, compare, or verify a group of elements or actions. Although a checklist may be published in a manual, it is usually intended to be used by itself, so that reference to a manual is made unnecessary. Checklists are usually formatted and presented on paper; however, they may be formatted on electronic or mechanical devices, or presented in an audio format. A checklist may or may not represent an abbreviated procedure. The items listed on a checklist may be unrelated and may not represent a procedure, such as most "normal" checklists. Abnormal and emergency checklists, however, do represent procedures.

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**NOTE:** Checklists and procedures are often confused. Operators have sometimes titled procedures “expanded checklists” or titled checklists “abbreviated procedures.” A procedure is a set of actions or decisions prescribed to achieve a specified objective. A checklist is a physical aid used to overcome the limitations of human memory.

**O. “Normal.”** When normal is used to describe a procedure or checklist, it refers to a routine operation (without malfunctions).

**P. “Emergency.”** When emergency is used to describe a procedure or checklist, it refers to a non-routine operation in which certain procedures or actions must be taken to protect the crew and the passengers, or the aircraft, from a serious hazard or potential hazard.

**Q. “Non-normal” or “Abnormal.”** When non-normal or abnormal is used to describe a procedure or checklist, it refers to a non-routine operation in which certain procedures or actions must be taken to maintain an acceptable level of systems integrity or airworthiness.

**R. “Alternate.”** When alternate is used to describe a procedure or checklist, it refers to a procedure that may be employed instead of another procedure. Alternate procedures may either be normal, non-normal, or abnormal procedures.

**S. “Supplemental.”** When supplemental is used to describe a procedure or checklist, it refers to a procedure that may be employed in addition to a normal, non-normal, or abnormal procedure. Supplemental procedures may either be normal or non-normal procedures.

**T. Phase Checklist.** A checklist used to establish and/or verify aircraft configuration during a specific phase of flight. An example of a phase checklist is an “after-takeoff checklist.”

**U. Normal Checklist.** A checklist comprised of all of the phase checklists used sequentially in routine flight operations.

**V. “Approved.”** When approved is used to describe a document, manual, or checklist, it means that a regulation requires GACA approval and that the GACA has evaluated and specifically approved the document, manual, or checklist. Approvals of procedures are most easily accomplished by using OpSpec paragraph A7 or D72, as appropriate, to identify and record specific aspects or procedures within the operator’s manuals that are approved (see Section 2 of this Chapter).

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**W. “Authorized.”** Authorized, as used in the GACARs generally has the same meaning as Approved, in which case the person or entity can do what has been “approved or “authorized”.

**X. “Accepted.”** Accepted is used to describe a document, manual, or checklist that does not have, or is not required to have, GACA approval. Accepted means the GACA has reviewed the application, filing, method, procedure or policy in question, and has neither objected to nor approved its proposed use or implementation. Only a portion of an operator’s manuals are required to have GACA approval. The remaining portions are “accepted” by the GACA. Operators are required to submit the entire manual system to the GACA for review. If the GACA concludes that an accepted section of the manual is not in compliance, the GACA must formally notify the operator of the deficiency. Upon notification, the operator must take action to resolve the deficiency.

**Y. “Document.”** A document is a written description of a system, a method, or a procedure; a written statement of authorizations, conditions, or limitations; or a file of information. A document serves as an official record of understanding and agreement between the GACA and the operator as to the means the operator will use to comply with regulatory requirements. An approved document is not a manual. Relevant information from a document, however, may be extracted and published in user manuals. For example, the OpSpecs are not a manual but an approved document from which information is extracted.

**Z. Pilot-Flying (P-F).** The pilot who is controlling the path of the aircraft at any given time, whether the aircraft is in flight or on the ground.

**AA. Pilot-Not-Flying (P-N-F).** The pilot who is not flying or controlling the path of the aircraft.

**BB. Immediate Action.** An action that must be taken in response to a non-routine event so quickly that reference to a checklist is not practical because of a potential loss of aircraft control, incapacitation of a crew member, damage to or loss of an aircraft component or system—which would make continued safe flight improbable.

**CC. High Workload Environment.** A high workload environment is any environment in which multiple demands on the flight crew necessitate the prioritizing of work functions. For example, instrument flight rules (IFR) operations below 10,000 feet during arrival or departure from a terminal area (including taxiing) are considered to be high workload environments.

**DD. Systems Management.** The management of those systems that sustain the mechanical

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functions of the aircraft as opposed to the management of the aircraft's thrust, flightpath or aerodynamic configuration.

**EE. Warning:** An instruction about a hazard that if ignored, could result in injury, loss of aircraft control, or loss of life.

**FF. Caution:** An instruction concerning a hazard that if ignored could result in damage to an aircraft component or system that would make continued safe flight improbable.

**NOTE:** That information or instruction of such significance that special emphasis is required. Notes are usually added outside of or in addition to a formal outline or numbering system.

**4.12.1.7. DISTRIBUTION AND AVAILABILITY OF MANUALS.** Each operator is required to maintain the manuals required by the GACAR at their principal base of operations and to furnish all required manuals to the GACA office with oversight responsibility. In addition, each operator must make available or furnish applicable parts of the manual (user manuals) to flight and ground operations personnel who conduct or support flight operations. The manual may be in conventional paper format or in another form that is convenient for the user. Each employee to whom the manual or a user manual is furnished must keep it current. Each employee must have access to appropriate manuals or parts of manuals when performing assigned duties.

**4.12.1.9. REVIEW OF MANUALS.** Manuals must be reviewed by principal inspectors (PI) and other qualified Inspectors to ensure that they are adequate in content and are in compliance with applicable regulations, safe operating practices and the operator's OpSpecs. While PIs are encouraged to provide guidance and advice to operators in the preparation of their manuals, the development and production of an acceptable manual is solely the responsibility of the operator.

**A. Initial Review.** Before the initial certification of an applicant, a comprehensive review of the applicant's flight manuals and OM must be conducted by the POI and other qualified Inspectors. During the initial review of the OM, POIs must ensure that the operator has addressed the applicable topics discussed in Sections 3 and 4 of this Chapter. In addition, those items in the operator's final compliance statement that require the operator to develop a policy statement, system, method, or procedure must be addressed. If user manuals are furnished, those topics that apply to the specific user must be addressed. Each topic must be presented with enough detail to ensure that the user can properly carry out the portion of the policy or procedure for which the user is responsible. Appropriate review procedures are also required for Maintenance Manuals

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(MMs).

**B. Review of Changes to Manuals.** The POI should review each revision or proposed revision to a manual. Inspectors should not limit this review to a strict consideration of the change itself but should also consider the impact of the change on the operator's overall manual system, training program, and type of operation. Changes in the operator's OpSpecs should be accompanied by a review of applicable sections of the operator's manual.

**C. En Route and Ramp Surveillance.** Inspectors conducting en route and ramp inspections should review the flight manual and those portions of the OM carried by the flight crew for completeness and currency. When a flight is long enough to make it practical, Inspectors should review these manuals more in depth, particularly those sections that are operationally relevant to the flight in progress.

**D. Periodic Review of Manuals.** The continual review of an operator's manuals is necessary because both the aviation environment and the operations conducted by the operator are constantly changing. Each POI is responsible for developing a surveillance plan for the operator's flight safety document system or manual system, as applicable. At least one portion of each of the operator's manuals should be reviewed annually, and the entire manual should be reviewed over a period of 1 to 3 years (depending on the complexity of the operation). This periodic review should be planned as a distinct event so that every portion of the manual is systematically reviewed at some time over a 1- to 3- year cycle. This periodic review should be coordinated between Principal Inspectors (PIs) and other Inspectors to ensure an appropriate exchange of information and to avoid redundant reviews.

**4.12.1.11. FORMAT AND STYLE OF MANUALS AND CHECKLISTS.** GACAR §§ 121.139 (c), 125.77(c) and 135.83 (c) require that each page of a manual must include the most recent revision date. In general, manuals and checklists should be easy to use and understand, and in a format that can be easily revised. When evaluating manuals and checklists for ease of use and understanding, Inspectors should consider the following guidance concerning format and style:

**A. Form.** All or part of a manual may be prepared and maintained in conventional paper format (book form) or in other forms, such as microfilm or computer-based storage with electronic image.

**B. Preface Page.** The first page of a user manual should be a preface page containing a brief statement about the manual's purpose and the intended user. The preface page should also contain a statement that emphasizes that the procedures and policies in the user manual are

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expected to be used by company personnel.

**C. Revision Control.** Each manual should be easy to revise. Also, each manual should contain a revision control page or section from which the user can readily determine whether the manual is current. This page or section should preferably follow the preface page, but it can be organized in any logical manner. The control date of the most recent revision of each individual page must appear on each page. Complex operators should establish a bulletin system to bring temporary information or changes that should not be delayed by a formal revision process, to the attention of the user. The bulletin system should have a means of control that includes giving bulletins a limited life and systematically incorporating them into appropriate manuals in a timely manner. Users should be able to easily determine whether they possess all current bulletins.

**D. Table of Contents.** Each manual should have a table of contents containing lists of major topics with their respective page numbers.

**E. References.** Manuals must include references to specific regulations when appropriate. A reference to regulations or other manual material is appropriate when it is necessary to clarify the intent of the text or when it is useful to the user for looking up specific subject matter. References should not be made to advisory circulars and to preambles of any applicable regulations, as these sources are advisory and not binding in nature. Operators should use caution when adapting the text of advisory documents into their manuals. Advisory text may not translate into a directive context.

**F. Definitions.** Significant terms used in manuals should be defined. Any acronym or abbreviation not in common use should also be defined.

**G. Elements of Style.** Manuals and checklists should be composed in the style of general technical writing. This style should be clear, concise, and easy to understand. When evaluating manuals, Inspectors should be knowledgeable of the following suggestions for accomplishing clarity in technical writing:

1) Whenever possible, short, common words should be used. Examples of this include the following: using the words “keep” or “hold” instead of “maintain”; using the word “start” instead of “establish”; and using the word “stop” instead of “terminate.”

2) When a word has more than one meaning, the most common meaning should be used. For example, the word “observe” should be used to mean “see and take notice of” rather than

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“obey and comply.”

- 3) Operators should standardize terminology whenever practical. For example, since the terms “throttles” and “thrust levers” refer to the same item, the operator should choose one term and use it consistently throughout the manual. Once a particular term has been used in a specific sense it should not be used again in another sense.
- 4) Terms that command actions should be clearly defined, such as “checked,” “set,” and “as required.” Since auxiliary verbs such as “may” and “should” are ambiguous and can create room for doubt, they should not be used when a definite action is commanded. Instead, verbs such as “shall” and “must” are preferable to use when an action is commanded because they are more definite.
- 5) All “instructions” should be given in the imperative mood and the active voice. For example, “Hold the speed between VREF and VREF plus 10 knots” is preferable to “The speed needs to be held between VREF and VREF plus 10 knots.”
- 6) To provide appropriate degrees of emphasis on specific points in the text, “cautions,” “warnings,” and “notes” should be in the operator’s manuals and checklists.
- 7) Any instruction, particularly a warning or a caution, must begin with a simple directive in the imperative mood that informs the reader precisely what must be done. To avoid obscuring the directive in the background information, the directive must be stated first and then followed with an explanation. An example of how a directive can be obscured in background information is as follows: “Warning —To avoid the hazard of striking ground handling personnel with the free end of a swinging tow bar, do not place feet on rudder pedals until the captain takes the salute from the ground handler. The hydraulic nosewheel steering can sling the towbar with hazardous force.” In contrast the following is an example of the preferred method of placing the directive first: “Warning—Do not place feet on rudder pedals until the captain takes the salute from the ground handler. The hydraulic nosewheel steering can sling a towbar with sufficient force to cause serious injury to ground handling personnel.”
- 8) Descriptions in the manual should not be overloaded, but should be presented simply and sequentially. An example of an overloaded description is as follows: “A CSD per engine drives the AC generator at a constant speed of 8,000 RPM regardless of the speed of the engine or the load on the generator.” The following is an example of a clearer, more

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concise description: “A CSD is mounted between each engine and generator. The CSD holds the generator speed at a constant 8,000 RPM.”

9) Long sentences should be avoided in the manual. The following example consists of subject matter put into a long sentence, which makes it difficult to understand: “During gear retraction, the door-operating bar located on the landing gear leg contacts and turns the latch, withdrawing the roller from the slot as a second roller entraps the door-operating bar.” The following example consists of the same subject matter used in the previous example; however, when it is broken down into shorter sentences, it is easier to understand: “During landing gear retraction, the door-operating bar on the landing gear leg is pressed against the door latch. The latch turns, thus freeing the door roller. The roller moves out of the slot. A second roller then traps and holds the door-operating bar.”

**4.12.2.13. ADEQUACY OF PROCEDURES.** Specific guidance for the evaluation of flight manual procedures is in Section 3 of this Chapter. The following general guidance, however, is provided for Inspectors to use when evaluating procedures in any manual, including flight manuals:

**A. Objective.** The objective of a procedure must be stated clearly unless it is so commonly understood that a statement of the objective is not necessary.

**B. Logical Sequence.** Procedures are to flow in a logical step-by-step sequence. The most effective procedures are usually simple and each should contain only the information necessary for accomplishing that procedure. Preferably, procedures should be described in a sequential step-by-step format rather than a narrative format.

**C. General Considerations.**

- 1) A procedure must be an acceptable method for accomplishing an intended objective.
- 2) The individual responsible for each step of a procedure must be clearly identified.
- 3) The acceptable standards of performance for a procedure are to be stated if those standards are not commonly understood or clearly obvious.
- 4) Since a variety of personnel with differing degrees of expertise are involved in procedures, adequate information concerning the accomplishment of a procedure must be provided for the least experienced individual. A procedure may be described very briefly and concisely when

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the user is capable of achieving the objective without extensive direction or detail. When the user has limited training or experience, however, a procedure must be described in enough detail for the user to correctly accomplish it. When the user has limited access to other sources of information and guidance while performing a procedure, enough detail should be provided to make the user independent of other sources of information.

- 5) When a form, checklist, or tool is necessary to accomplish a procedure, the location of that item must be indicated in the procedure.
- 6) Enough time should be available under normal circumstances for the user to accomplish a procedure. If sufficient time is not available to the user for accomplishing a procedure, either the procedure itself or the user's duties must be revised.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 2. Approval and Acceptance of Manuals and Checklists**

**4.12.2.1. GENERAL.** This section contains direction and guidance for principal inspectors (PIs) when approving or accepting an operator's manuals and checklists. This process is based on the general process for approval or acceptance described in Volume 1, Chapter 4, Section 1, of this handbook.

**A. The Approval/Acceptance Process.** The approval process for a General Authority of Civil Aviation Regulation (GACAR) Part 121, 125, 133 and 135 operator's checklist normally consists of Phases One, Two, Three, and Five of the general process. It may be necessary, however, for a PI to require that Phase Four (the demonstration phase) be included in the approval process.

**NOTE:** Each phase of the general process for approval or acceptance is discussed as if it is separate and distinct; however, at times the phases may overlap.

**B. Evaluation of Manuals for GACA Acceptance or Approval.** An operator may develop and publish in its manuals any policy, method, procedure, or checklist that the operator finds necessary for the type of operations conducted. These policies, methods, procedures, and checklists, however, must comply with the GACAR and be consistent with safe operating practices. PIs should encourage operators to be innovative and progressive in developing such policies, methods, procedures, and checklists. The PI's role in the review process is to provide an independent and objective evaluation of the operator's manual material. The PI must ensure that the operator's material complies with the GACAR, is consistent with safe operating practices, and is based on sound rationale or demonstrated effectiveness.

**C. Use of OpSpec Paragraph A7 for Approval of Certain Portions of Operations Manuals.** Operations Specification (OpSpec) paragraph A7 has been developed for the General Authority of Civil Aviation (GACA) to use to approve those portions of the OM that require an approval by the President. Use of this OpSpec paragraph will assist the PI in approving individual pages or sections of required manuals. Those approvals are required by all of the operating rules, i.e., Parts 121, 125, 133 and 135. Specific required approvals within the various operating rules may vary slightly depending upon the specific requirements of the operations contemplated.

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**D. Use of OpSpec Paragraph D72 for Approval of Maintenance Manuals.** OpSpec paragraph D72 is utilized to approve a GACAR Part 121 Continuous Airworthiness Maintenance Program (CAMP) and this approval includes the approval of the Maintenance Manual (MM) which is part of a CAMP. Operators not utilizing a CAMP do not have their MM approved by the GACA, rather it is accepted by the GACA.

**E. Discrepancies.** When a PI finds a discrepancy in an operator's existing manual material, the PI shall take action to have that discrepancy resolved. Usually such discrepancies can be resolved through informal discussions. When an informal discussion cannot resolve the discrepancy, however, the PI is required to formally withdraw GACA approval or acceptance from the operator (see paragraph 4.12.2.13 of this section for guidance on the formal actions that may be taken).

**4.12.2.3. PHASE ONE: ESTABLISHING A FRAMEWORK FOR REVIEW.** The first phase of the approval or acceptance process begins with communication between the GACA and the operator (either a current operator or an applicant for a certificate). There are three occasions when approval or acceptance of manuals and checklists is required, as noted below:

- When an applicant applies for a certificate
- When an existing operator determines if a change is necessary
- When, as the result of an investigation or normal surveillance, the PI determines if a manual, a manual section, or a checklist is inadequate or deficient

**A. Determining Basic Requirements Applicable to the Operator.** The primary task of the PI during Phase One is to determine the basic requirements that the operator must meet to obtain acceptance or approval of a manual or checklist. The PI must communicate these requirements to the operator. To do this, the PI should review the applicable sections of this handbook (particularly Volume 3, Chapter 2, Section 1) and any other pertinent GACA guidance. Both the PI and the operator must clearly understand the topics and level of detail the operator is required to have in the material to be submitted during Phase Two of the process. During Phase One, the PI should make the following determinations and communicate them to the operator:

- Whether the submission will involve approval or acceptance
- Whether there is a need for validation tests or other demonstrations

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- Whether there is a need for supplementary documentation, analysis, or other data to support the submission

**B. Methods for Manual or Checklist Organization.** During Phase One, the PI should inform the operator that there are various methods that can be used to organize and format those manuals, manual sections, and checklists requiring GACA approval/acceptance. The PI may inform the operator of the content of the following subparagraphs, which describe at least four possible methods that an operator may use:

1) *Limited Content.* An operator may choose to limit the content of the manual solely to approved material. When this method is used, the entire manual must be accepted and the operator may not revise the manual without additional review by the PI. While this method facilitates GACA review and acceptance, the manual may be difficult to use because the intended user may have to frequently switch back and forth between the approved checklists and other manuals containing accepted material. When the operator chooses this method, PIs must ensure that a header or footer is on each page indicating that the material is GACA approved.

2) *Grouping Material.* An operator may choose to group the GACA approved material in specified sections of the manual and place accepted material in the remaining sections. With this method, the PI must ensure that a header or footer is on each page of the approved sections indicating that the material on that page is GACA approved. The operator may submit the approved and accepted sections to the PI as separate packages.

3) *Interspersed Material.* An operator may choose to intersperse GACA approved material and accepted material throughout the manual. When an operator chooses this method, the PI must ensure that the operator has clearly identified approved material each time it appears in the manual. This method of organization allows for efficient manual use, but makes the operator's publication process and the approval process difficult.

4) *“Approval Document.”* The operator may choose to place material in an “approval document” solely for the purpose of obtaining GACA approval of that material. An approval document is a document and therefore may not be used as a manual. After the document has been approved, the operator must develop user manuals that incorporate the approved information from the document along with detailed guidance and supplementary information. When this method is used, the user manuals are treated as “accepted” material and do not

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have to be individually approved. The PI must, however, review the user manuals to ensure that the information in them is consistent with the approval document. When using this method, the operator may revise the information in user manuals without prior GACA approval, provided the revision is consistent with, and does not conflict with, the information in the approval document. If the operator or the PI finds it necessary for the approval document to be revised, the operator must submit the proposed revision for review and approval. A revision to an approval document must be approved before the operator can incorporate the changed information into the user manuals. When an operator uses this method for submitting manual or checklist material for GACA approval, PIs must ensure that the operator has stated on the first page of the user manuals that the manual contains GACA approved material. The manuals or checklists provided to the user, however, do not have to be specifically identified as being GACA approved documents.

**C. Submission of Material.** During Phase One, the PI should advise the operator on how to submit the documents, manuals, checklists, and subsequent revisions for approval or acceptance.

1) *GACA Approval Submission.* For material that requires GACA approval, the PI should advise the operator to submit the following:

- Two copies of the document, manual, manual section, checklist, or revision to be approved; one copy of the printed version of the electronic checklist (as applicable); one copy of a report indicating differences between the proposed and current versions of the electronic checklist (as applicable) or
- One copy of the document, manual, manual section, checklist, or revision, and two copies of the page control sheets for the material (The page control sheets must show an appropriate revision number or original page number for each page and the effective date of each page.)
- A copy of any supporting documentation or analysis

2) *GACA Acceptance Submission.* For material that is to be evaluated for acceptance by the GACA, the PI should advise the operator to submit the following:

- A copy of the manual, manual section, checklist, or revision to be reviewed
- A copy of the page control sheets for the material to be reviewed, when appropriate

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**D. Coordination of Submitted Documents.** PIs should encourage operators to coordinate drafts of manuals and checklists and revisions before making a formal submission. Mutual agreement on major points should be reached between the operator and the PI before the material is put in final form. Operators should be advised by the PIs not to publish or distribute material requiring GACA approval until after they have received written notification that the material has been approved. An operator who prepares and distributes such material before receiving approval may have to make costly changes. The PI should encourage the operator to establish methods that streamline and simplify the process for both the operator and the PI.

**4.12.2.5. PHASE TWO: PRELIMINARY REVIEW.** Phase Two consists of the PI or a qualified Inspector conducting a preliminary review (as opposed to a detailed analysis) of the operator's submission. This preliminary review is intended to ensure that the operator's submission is clear and contains all required documentation. The Phase Two review should be conducted promptly after receipt of the operator's submission. If, after preliminary review, the submission appears to be complete and of acceptable quality, or if the deficiencies are immediately brought to the operator's attention and may be quickly resolved, the PI may begin the phase three in-depth review (see paragraph 4.12.2.7, which follows, in this section). If the submission is incomplete or obviously not approvable or unacceptable, the process is terminated and the PI must immediately return the submission (preferably within 5 working days) with an explanation of the deficiencies. PIs should return the submission to the operator promptly so that the operator will not erroneously assume that the PI is continuing the process to the next phase.

**4.12.2.7. PHASE THREE: IN-DEPTH REVIEW.** Phase Three is a detailed analysis of the operator's submission. During this phase, a qualified Inspector must review the operator's submission in detail to determine that the submission is complete and technically correct. The time to complete phase three depends on the scope and complexity of the submission. During the phase two preliminary review, the PI should determine whether the review can be completed within 10 working days. If any part of the submission requires GACA approval, and the PI determines that it will take longer than 10 working days to complete the review and approval process, the PI shall give the operator an estimate of the time it should take to complete the process.

**A.** The Phase Three review and analysis should confirm that the operator's submission conforms to, or is consistent with, the following:

- GACARs

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- Criteria and guidance in this handbook
- The operator's OpSpecs
- Criteria and guidance in Advisory Circulars
- Applicable aircraft flight manuals, manufacturer's operating bulletins, and airworthiness directives
- Safe operating procedures
- The operator's cockpit resource management policies

**NOTE:** The direction and guidance in this chapter for reviewing procedures and checklists have been developed after consultation with knowledgeable and experienced personnel in the air transportation industry, aircraft manufacturers, and the GACA. The information presented is considered to be the best guidance currently available on the topic. PIs should realize, however, that circumstances vary widely. The best set of procedures for one circumstance may not work well in another circumstance. Two recommendations may be in conflict. In such cases, the appropriate resolution must be achieved through compromise. For example, it may be more important for an operator's checklist and procedures design policies to be internally consistent than for an individual procedure to be designed in a specific way.

**B.** The PI should thoroughly consider the operator's experience and history when evaluating procedures and checklists. When an operator has a history of successful operations, the PI should normally approve submissions consistent with the operator's existing procedures. When an operator has an incident or accident attributable to crew error, the PI must thoroughly examine the basic assumptions and policies in the design of the operator's checklists and operating procedures.

**C.** Review of electronic checklist modifications in applications with the ability to automatically detect the completion of an action shall include verification that this detection is based on monitored conditions that are consistent with the objective of the action (for example, a checklist action item for LANDING GEAR . . . DOWN would show complete on the sensing of the gear handle being down and the gear indication being down). The review and verification should be accomplished using a paper copy of the electronic checklist annotated with the monitored condition for each action whose completion is automatically detected.

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**4.12.2.9. PHASE FOUR: VALIDATION TESTS.** Operators should be encouraged by PIs to conduct validation tests of operating procedures and checklists during the development process. These validation tests should be conducted before the operator submits the proposed procedures and checklists for GACA review and approval. Whenever possible, the PI or a qualified Inspector should observe these tests. Under certain circumstances, a validation test may have to be conducted after the Phase Three in-depth review. In other circumstances, especially for minor types of revisions or simple procedures or checklists, validation tests may not be warranted or appropriate. Before approving operating procedures and checklists, PIs should consider the following guidance concerning validation tests.

- A.** Aircraft operating procedures and checklists should be tested in realistic real-time scenarios, with a full crew complement.
- B.** Validation tests of normal procedures may be conducted in a flight simulator, in a flight training device, on training flights, or in conjunction with proving tests.
- C.** Validation tests of non-normal, abnormal, and emergency procedures or checklists should be conducted in a flight simulator or training device. Tests of non-normal and emergency procedures and checklists may be conducted in an aircraft; however, the operator must ensure that the test can be conducted safely. Testing of non-normal and emergency procedures and checklists shall not be conducted during revenue service.
- D.** Operators may submit evidence that a qualified party (such as the manufacturer or another operator) has already conducted a validation test of a procedure or checklist. When such evidence is available, the PI should not require a validation test unless the operator's circumstances are significantly different from those in which the original tests were conducted.
- E.** Changes in the wording of a procedure may not actually change the procedure. In such cases, validation tests are not necessary.
- F.** PIs shall require that operators validate the safety and effectiveness of any addition, deletion, or change of sequence in the steps of a non-normal or emergency checklist, through validation testing.
- G.** For those operators who intend to convert immediate action items to or from challenge-do-verify items on an emergency checklist, PIs shall require that they test the modified procedure

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to ensure that it is safe, effective, and has no adverse effects. PIs should consult with the appropriate FAA Aircraft Evaluation Group (AEG) before approving such changes through the appropriate GACA communications procedures.

**H.** The addition or deletion of individual items to a normal phase checklist does not usually need to be validated by a test. If the PI is of the opinion that the change significantly alters crew member assignments or workload distribution, the PI shall require a validation test.

**I.** While electronic checklists must comply with the same guidelines discussed here, modification to an existing electronic checklist does not in itself require a validation test if the PI deems the modification to be minor.

**4.12.2.11. PHASE FIVE: GRANTING GACA APPROVAL.** Phase Five consists of the PI granting GACA approval to manuals, manual sections, and checklists. During this phase the PI must formally notify the operator of the approval and also complete a specific record of the approval. For manuals and manual sections which are not required to have GACA approval, written notification of acceptance is not required and shall not be given.

**A. Notification of Approval.** When the PI decides to approve a document, manual, manual section, or checklist, the following procedures may be used:

1) *Approve or Amend OpSpecs.*

a) PIs and others with approval authority may either approve or amend OpSpecs by annotating and recording approval of documents, sections of documents, checklists or programs where OpSpec paragraphs have been designed. POIs may use OpSpec paragraph A7 to approve the use of Company Flight Manuals, Operations Manuals (OM), parts of Operations Manuals that have been renamed specifically, such as Cabin Crew Member Manual (CCMM) or sections of those manuals. Paragraph D72 may be used to approve the Maintenance Manual required under a CAMP.

2) *Historic Approvals, as applicable:*

a) For a document, manual, or checklist that contains page control sheets, the PI may annotate both copies of the page control sheets with the phrase “GACA Approved.” Under the words “GACA Approved,” PIs may enter the effective date of approval and sign both copies. The operator may preprint the words “GACA Approved” and blank

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lines for the date and signature on the page control sheets, or the PI may use a stamp to add the approval annotation on each sheet.

- b) For manuals, manual sections, or checklists that do not contain page control sheets, the approval annotation may be placed by the PI on each page of the material. In this case the approval annotation must be made on two copies of the material. The annotation shall be the same as discussed in subparagraph A1 above. This procedure should be used only for very short manuals, manual sections, or checklists (usually fewer than five pages) or when the use of page control sheets is not practical or serves little purpose.
- c) When page control sheets are used, the PI shall return one copy of the annotated page control sheets to the operator. In the remaining cases, one copy of the approved material must be returned to the operator with a notification letter that states that the material is approved. This letter should also contain a statement advising the operator to maintain for its records the signed page control sheets or the material with the approval annotation. The PI shall retain the second copy of the signed page control sheets or the annotated material in the GACA office files.
- d) When electronic checklists are submitted for approval, the operator will prepare a release/cover sheet for the printed version of the electronic checklist. The release/cover sheet will contain the preprinted words and lines as discussed in subparagraph A1, above. The PI's annotation shall be the same as discussed in subparagraph A1.

**B. Notification of Disapproval.** The coordination, revision, and editing activities that take place throughout all phases of the process should eventually result in approved products. Under certain circumstances, however, it may be appropriate for the PI to terminate the process. For example, the operator may not take any action on the material for 30 days. To terminate the approval process, the PI shall return the entire submission to the operator with a letter stating that the GACA is unable to grant approval, along with the reasons why it cannot be granted. (See A above, Notification of Approval for a discussion of procedures associated with this subject.)

**C. GACA Office Records.** The PI shall maintain a record of approval for each operator-submitted document, manual, manual section, and checklist. The use of OpSpec A7 can be used to help facilitate this tracking. Records of approval to revisions of this material must also be

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maintained. The records should consist of page control sheets (or approved material if page control sheets are not used), notification letters, and any other related correspondence. While superseded portions of documents, manuals, or checklists do not have to be retained, PIs may retain this type of material if they determine that it is appropriate. The PI should include with the material in the operator's file a brief memorandum containing the reasons for retaining the material.

**4.12.2.13. NOTIFICATION OF DEFICIENCIES.** When any portion of approved material that is currently in use is found to be deficient, the PI shall notify the operator and request prompt action to resolve the deficiency. Deficiencies can usually be resolved through an informal process; however, when this cannot be done, the PI must formally notify the operator by letter that the deficiency must be corrected.

**A. Deficiency Involves GACA Approved Material.** If the deficiency involves GACA approved material, the letter must contain a clear statement that GACA approval of the material will be withdrawn as of a specific date if corrective action is not taken. The letter should also contain a statement that the material does require GACA approval and that after the specified date, any operations without that approval will be in violation of the GACARs.

**B. Deficiency Involves Operator-Developed Material.** If the deficiency involves operator-developed material that is accepted by the GACA, the letter should clearly indicate the material that is deficient and the reasons why it is deficient. If, after such notification, the operator still fails to take appropriate corrective action, the PI should attempt to negotiate a reasonable solution. When these attempts fail, the PI may, after coordination with the Office Manager, amend the operator's OpSpecs to withdraw the authorization for conducting the operations affected by the deficiency.

**4.12.2.15. EMERGENCY REVISIONS.** For safety reasons, an operator may sometimes find it necessary to immediately revise GACA approved material before there is an opportunity to coordinate the revision with the PI. In such cases, the operator should take action as necessary to make the revision effective (such as alert bulletins and dispatch messages). For example, an operator may become aware of a deficiency after business hours, on a weekend, or on a holiday. In such cases, the operator should take immediate action. When emergency revisions to GACA approved material are made, the operator shall notify the PI of the revision at the earliest practical opportunity (preferably the first working day after the action). Since there are a wide variety of reasons for requiring emergency revision action, the PI must determine the best course of action to be taken after being

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notified of the emergency revision. PIs shall make assigned operators aware of this guidance.

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#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 3. Evaluate a Flight Manual for Parts 121, 125 and 135**

**4.12.3.1. GENERAL.** This section contains direction and guidance to be used by Principal Operations Inspectors (POIs) in the evaluation of flight manuals for the General Authority of Civil Aviation Regulation (GACAR) Part 121, 125 and 135 operators. GACAR § 91.303(c)(20) requires that a General Authority of Civil Aviation (GACA) approved flight manual (or equivalent) be carried aboard each aircraft for the guidance of crew members when conducting flight operations. GACAR §§ 121.147 and 125.83 require that an operator keep a current approved aircraft flight manual (AFM) or approved equivalent for each type of aircraft it operates at its principal base of operations and in each aircraft of that type that it operates. GACAR § 135.601(a)(3) requires that Part 135 operators make available to each pilot, aircraft equipment manuals and AFM or equivalent for each aircraft used in their operations. GACAR § 91.13 states that no person may operate a civil aircraft without complying with the operating limitations specified in the approved aircraft flight manual (AFM).

**A. Equivalent Flight Manuals.** To satisfy Part 91, 121, 125 and 135 requirements, operators may use either the approved aircraft flight manual (AFM), or they may develop, obtain approval for, and use a company flight manual (CFM), which may also be referred to as a Flight Crew Operating Manual (FCOM). These manuals are defined by the General Authority of Civil Aviation (GACA) as being a part of the Operations Manual (OM), reference GACAR §§ 121.147 (b), 125.83 (b) and 135.85 (b). AFMs are acceptable for satisfying the regulations in cases of small, simple aircraft. Operators who operate multiple aircraft types usually find it efficient to collect policies, procedures, and guidance common to all aircraft in a single manual. In this case, the CFM or FCOM contains only those policies, procedures, and guidance that apply to the operation of the specific aircraft. POIs shall use this section as guidance when evaluating an operator's AFMs or CFMs.

**4.12.3.3. APPROVED AIRCRAFT FLIGHT MANUALS (AFM).** GACAR Part 21 requires that aircraft manufacturers provide an approved AFM with each aircraft certified after March 1, 1979. Prior to this date, approved flight manuals were required only for transport category airplanes. For Saudi Arabia-registered aircraft, the GACA-approved AFM is considered to be the FAA-approved AFM (even for aircraft manufactured in countries other than the United States).

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**A. Approved Sections of AFMs.** AFMs of transport category airplanes contain three sections which are approved. These are the procedures, performance data, and limitation sections. Mass and balance limits (Weight and Balance Limits within the US system) for transport category airplanes are given in the limitations section. AFMs of airplanes approved under GACAR Part 23 or rotorcraft approved under GACAR Part 27 or 29 contain four approved sections: procedures, performance data, limitations, and mass and balance (mass and balance). If these sections referenced above are included in a manual with other data, or material, these sections must be clearly marked as AFM data.

1) *Procedures Section of AFMs for Complex Aircraft.* The procedures section of an AFM for a complex aircraft is typically not suitable for flight crew operational use. The certification regulations only require that the procedures section of an AFM contain specific and detailed procedural information related to the unique characteristics of the aircraft. These manuals are not required to contain each and every procedure necessary to operate the aircraft. Most manufacturers of complex aircraft develop and have approved only those procedures necessary to certify the aircraft. The certification regulations do not require that procedural information be expressed in sequential, step-by-step format suitable for publication in a checklist format for instance. AFM procedural information may be supplied in narrative format. POIs must ensure that operators have rewritten such AFM procedures to make them suitable for flight crew use in Part 121 and 125 operations and as may be applicable for any operation under the GACARs.

2) *Performance Data Section of AFMs for Complex Aircraft.* AFMs for complex aircraft contain extensive performance data sections. All performance information necessary to operate the aircraft is in this section. The AFM performance data section of a complex aircraft is typically not suitable for flight crew use. This section is suitable for use by performance engineers. As an example, performance data presented in a Company Flight Manual (CFM) is usually presented in a tabular format, which is easier for flight crews to use in daily operations. This data is typically accepted data.

3) *Procedures and Performance Data Sections under GACAR Parts 23 and 27.* AFMs of smaller, less complex aircraft certified under Part 23 and rotorcraft certified under Part 27 typically contain performance data and procedures sections that are suitable for flight crew use. POIs of operators using these aircraft shall review the applicable manual to ensure that these sections are appropriate for flight crew use in the operation being conducted.

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**B. Unapproved Sections of AFMs.** In addition to the approved sections of AFMs, aircraft manufacturers often include other information which does not require approval under the certification regulations in an AFM. For example, a manufacturer may include systems descriptions, recommended procedures, or correction factors for wet runways in an accepted section. The FMRB does not formally review this type of information and the GACA/FAA does not approve it. The GACA/FAA only acts on this type of information when some part of the information has been discovered to be unacceptable and is then brought to the attention of the GACA/FAA.

**C. Use of AFMs as Flight Manuals.** When an operator proposes to use an AFM as the required flight manual, the POI must review both the approved and unapproved (accepted) sections of the manual. The POI must determine that the information in the AFM is presented in a manner that is suitable for use by the flight crew, that it is compatible with the type of operation conducted by the operator, and that it contains all of the required information and procedures.

1) *Certification Regulations versus Operational Requirements.* Aircraft currently used in air transportation operations have been certified under the provisions of 14CFR Parts 23, 25, 27 or 29 (which are incorporated by reference in GACAR Parts 23, 25, 27, or 29) or under the regulations of another government and accepted by the United States in accordance with a Bilateral Air Safety Agreement. The assumptions, limitations, and requirements of these aircraft certification regulations may differ from the operational requirements of 14 CFR and/or GACAR Parts 121 and 135. The direction and guidance concerning procedures and performance which operators must provide to flight crews for aircraft operations under GACAR Part 121, 125 or 135 is normally more comprehensive than that published in an AFM. For example, basic crew coordination procedures such as standard altitude awareness call-outs during departures and approaches are not usually in an AFM.

2) *Supplementary Information.* When POIs find that the procedures or performance information published in an AFM is insufficient for the operation to be conducted, the POI shall require the operator to develop supplementary information and make it available to flight crew members. It is acceptable for operators using an AFM as the required flight manual to place supplementary information in a section of the operations manual (OM), such as a flight operations policy manual (FOPM) or a flight training manual.

3) *Aircraft Certified Without an AFM.* An AFM may not have been prepared for an airplane

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or rotorcraft certificated before March 1, 1979. While this may not be a problem in the Kingdom of Saudi Arabia (KSA) owing to the early date of manufacture, GACAR § 91.303(c)(20) requires that the same information required to be in an AFM, be available aboard these aircraft. The only practical method for meeting this requirement for aircraft of 2730 kg (6,000 pounds) maximum takeoff mass (MTOM) or more is for the operator to prepare a CFM which contains performance, procedures, and limitations. Some smaller aircraft may be operated satisfactorily with the information presented by placards in the aircraft.

**4.12.3.5. COMPANY FLIGHT MANUALS (CFM).** A CFM containing the required information and approved by the POI under the provisions of this handbook is an equivalent flight manual for the purposes of GACAR §§ 121.147, 125.83 and 135.601 (a) (3). A CFM with appropriately approved sections is the only flight manual that needs to be carried aboard an aircraft. POIs must evaluate an operator's CFMs using the guidance that follows.

**A. Identification as a Flight Manual.** POIs must ensure that a CFM is clearly marked as an approved flight manual for a specific operator. Sections of a CFM which contain approved information must also be clearly identified.

**B. Approved Sections of a CFM.** POIs must ensure that the approved sections of a CFM contain all of the information that is required by the flight crew to operate the aircraft. POIs should evaluate the approved sections of a CFM for the following:

1) The procedures section of a CFM must contain all procedures required by the AFM and for each operation the operator conducts. As a minimum, the operator must include sufficient detail to allow a trained crew to safely and effectively operate the aircraft. The procedures section of the manual may be divided into subsections such as normal, non-normal, and emergency procedures.

2) The operator's performance data in a CFM must contain the data from the AFM and instructions on how to use that data. Operators may assign the responsibility for performing takeoff and landing data computations to flight crew or ground personnel. The flight crew must have access to adequate data in the cockpit, (including information for the specific aerodrome and runway to be used) to perform the computations for which they are responsible. When takeoff and landing data is presented in tabular format for specific runways, it is often referred to as an aerodrome analysis. Performance data may be published under separate cover and be given titles such as performance manual or aerodrome analysis.

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When performance data is published under separate cover, it must be identified as a portion of the CFM. Takeoff and landing performance data may be stored in an on-board or ground-based computer (see Volume 5, Chapter 3, Airplane Performance and Aerodrome Data).

3) The limitations section of a CFM must be clearly identified as GACA approved. The limitations section of a CFM must contain each limitation which is contained in the AFM.

**C. Accepted Sections of a CFM.** Accepted sections of a CFM may contain supplementary information such as aircraft and systems descriptions, an expanded explanation of procedures, special policies and procedures, and other selected topics pertinent to operation of the aircraft type. The accepted sections of a CFM must conform to the regulations and safe operating practices but do not need to conform to corresponding sections of the AFM, either in format or content. POIs should ensure that the CFM developed by or for the operator contains sufficient explanation and guidance for flight crew use in the safe operation of the particular aircraft type. Background information or information that is not specific to the operation of the particular aircraft should be placed in another section of the OM, rather than in a section of the CFM.

**4.12.3.7. AIRCRAFT SYSTEMS DESCRIPTION.** Operators must provide crew members with a systems description of an aircraft's systems and components that contains sufficient detail to allow flight crew members to adequately understand and perform all procedures in the flight manual. AFMs and CFMs may or may not contain a systems description section. The aircraft systems description section of a manual is "accepted" as opposed to "approved." Operators may choose to place the systems description information in an accepted section of a CFM or in a section of the OM, such as a training manual.

**4.12.3.9. PROCEDURES.** POIs should not construe procedures published in an AFM to be the only or best means of accomplishing a specific objective. Because AFM procedures are formulated primarily for aircraft certification purposes, POIs should encourage operators to develop procedures appropriate to operations for inclusion in a CFM.

**A.** Procedures incorporated in a CFM should be tailored by the operator to accommodate the operator's type of operation, fleet standardization objectives, and cockpit management objectives. As an operator's operations become more complex, it is progressively more important to include detailed guidance in the flight manual, which is specifically tailored to the operator's operations.

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**B.** Aircraft which have been modified by supplemental type certificate (STC) may require different procedures than unmodified aircraft. POIs must coordinate approval of procedures with Principal Maintenance Inspectors (PMIs) to ensure modifications are accounted for in the operator's procedures.

**C.** Procedural information included in a CFM must be presented in a step-by-step format. A procedural step in an AFM procedure must be included in the equivalent CFM procedure, unless the POI approves the deletion through the process described in subparagraph I that follows.

**D.** Operators are responsible for developing effective standard operating procedures. The development process for standard operating procedures consists of the operator or other qualified party (such as the manufacturer) conducting a painstaking task analysis of the man-machine-environment relationship. Although this analysis is time consuming and expensive, it is necessary to meet the required level of safety in air transport operations. General guidelines for POIs to use when evaluating these procedures are contained in Section 4, paragraph 4.12.4.11 of this chapter.

**E.** POIs should ensure that operators standardize their operating procedures both within and across aircraft types to the greatest extent possible. POIs should make operators aware of the following information concerning procedures for standardization.

1) Standardized procedures promote understanding and effective communications between crew members. Research has shown that standardized procedures and effective communications are significant factors in reducing error in the cockpit and in enhancing safety.

2) Crew members of most large operators operate numerous different aircraft during their career. Standardized procedures enhance a crew member's transfer of learning and minimize negative transfer when the crew member transitions from one aircraft to another.

3) A complete standardization of procedures may not be possible when there are significant differences between manufacturers and installed equipment. A high degree of standardization, however, is possible. For example, the flight procedures for: engine failure after V1, engine fire after V1, and a missed approach with an engine out, can be designed to be identical. Each procedure might include the aircraft climbing at a reference speed to an identical cleanup height, then accelerating, then retracting the flaps, and then continuing the climb at specified engine-out climb speed. The reference speeds might change depending

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on the aircraft mass, but the procedure could otherwise be identical. If the operator designed these procedures carefully, they could be used on all aircraft in the operator's fleet.

**F.** POIs may approve combined procedural steps. For example, an AFM procedure specifies a two-step procedure such as the following: Step 1—Smoke Goggles On, and Step 2—O2 Mask On. The POI could approve a one-step procedure such as the following: Step 1. Smoke Goggles and O2 Mask On. If there is a specific reason, however, for not combining the steps, the POI must not approve such combinations. For instance, if in the previous example, for some reason the smoke goggle has to be put in place before the O2 mask can be put into place, the two-step procedure should be retained.

**G.** POIs may approve an arrangement of procedural steps in a different sequence from the sequence in the AFM. The operator must demonstrate to the POI's satisfaction that the change in sequence is safe and effective through validation testing. The POI must ensure that adverse effects are not introduced. For example, with many aircraft the flaps are required to be extended or the trim to be set to specific settings before an adequate control check can be accomplished. If this sequence is reversed, the control check is invalid.

**H.** POIs may approve the combination of similar procedures into a single procedure. For example, it may be desirable for an operator to combine engine fire, engine failure, and severe engine damage procedures into a single procedure. POIs may approve the resulting procedure when validation testing shows the procedure to be clear, easy to use, and if it retains the safeguards of the individual procedures it replaces. If the combined procedure is too complex and becomes an error-prone procedure, the POI should not approve it.

**I.** The POI will require the operator to present evidence that newly developed procedures are effective. This may be done by analysis, documentation, or validation tests. Tests may be conducted by the manufacturer, the operator, or another competent party (such as a contractor). The POI or a designated Inspector qualified in the aircraft must evaluate the effectiveness of such tests.

**J.** If the POI has any question about the validity or safety of an operator-developed procedure, the POI should consult with the Director, Flight Operations Division. All such questions must be resolved before the POI approves the procedure.

**4.12.3.11. NORMAL PROCEDURES.** The normal procedures section of a CFM must contain procedures for each normal operation that flight crew members are required to perform. Each normal

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procedure should be amplified by the operator with sufficient instruction to ensure that the procedure is properly accomplished. POIs must ensure that this instruction is thorough enough to provide the least experienced flight crew member with sufficient information to perform the procedures.

**A.** Some operators include normal operating checklists and an explanation of how to accomplish each step of the checklists in the normal procedures section of the CFM. It may be more acceptable to place this specific information in another place in the OM so as not to disrupt the normal flow of the checklist/information. It is important to understand that an explanation of how to perform the normal checklist is important; however it may more appropriately be placed in a training reference or manual. Guidance for operational procedures for which there are no checklists (such as the takeoff procedure) must also be addressed. Procedures for crew coordination and for the use of checklists must be included. The procedures section of a CFM must contain clearly specified crew duties. For example, the procedures section should contain a specific assignment for the crew member that is responsible for setting power and maintaining directional control when the second-in-command (SIC) is conducting a takeoff.

**B.** POIs may require the operator to develop and publish normal procedures in a CFM which are not in the AFM, when the procedures are necessary to ensure an adequate level of safety. Instrument approach procedures, adverse weather operations, long-range navigation, and special procedures for CAT II and CAT III operations are all examples of required normal procedures which may not be in an AFM, but clearly, should be in the OM.

**C.** Operators may need to develop extensive procedures for operating computer-based systems in the cockpit. A description of computer displays and controls does not normally provide a crew member with adequate information to operate such systems. Procedures for computer operations should be keyed to menus and display prompts. Procedures should be written in an interactive format rather than as a rote listing of key strokes.

**4.12.3.13. MANEUVERS AND PROCEDURES DOCUMENT.** GACAR §§ 121.843(b)(3), 125.381(b)(4) and 135.383 (b)(3) require that operators publish “detailed descriptions or pictorial displays of the approved normal, abnormal, and emergency maneuvers, procedures and functions that will be performed during each flight training phase or flight check, indicating those maneuvers, procedures and functions that are to be performed during the inflight portions of flight training and flight checks.” Operators must obtain approval of the maneuvers and procedures descriptions before they may be published.

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**A.** Before approving the operator’s “maneuvers and procedures document,” POIs must ensure that it contains the tolerances which must be maintained in training and checking. POIs must ensure that the operator’s standards are appropriate for the aircraft being flown and for the operation being conducted. Operators should use the Practical Test Standards (PTS) (as amended), the manufacturer’s recommendations, and Volume 9 of this Handbook, to establish these standards. POIs should use the guidance that follows when evaluating the standards used in an operator’s maneuvers and procedures document.

- 1) The standards in FAA-S-8081-5 (PTS) (as amended) are particularly appropriate for pilots of single-engine and multiengine, general purpose families of airplanes and rotorcraft. There are many cases, however, in which the PTS standards may be inappropriate. For example, many large aircraft have speed command systems in which the correct final approach speed varies according to the center of gravity (CG) and flight conditions.
- 2) When the operator conducts special operations, such as lower than standard minimum takeoffs, the POI shall ensure that the tolerances the operator chooses are appropriate for that operation. For example, on a low visibility takeoff with an engine loss, the applicant must be able to continue to track the runway centerline lights until the aircraft is rotated to the takeoff attitude.

**B.** Operators may choose to publish the maneuvers and procedures description in a section of the OM for reference by flight crew members. The GACA recommends, however, that this description be placed in a section of the flight manual where it is available for inflight reference.

**4.12.3.15. NON-NORMAL AND EMERGENCY PROCEDURES.** Non-normal (or abnormal) and emergency procedures in an AFM are usually presented in more detail than are normal procedures. The steps and the order of steps in these procedures are often critical. POIs must exercise caution in approving the modification of non-normal and emergency procedures. The effects of most procedural steps on the airworthiness of the aircraft are obvious, but the effects of some are not. For example, it may be necessary to depressurize a hydraulic system to successfully perform a manual landing gear extension. Deleting a step or a change in the sequence steps of such a procedure could make the procedure ineffective. There have been instances in which operators have erroneously proposed modifying an AFM procedure, and POIs have unintentionally approved the modification which invalidated the certification basis of the aircraft. POIs should use the guidance that follows when evaluating an operator’s non-normal or emergency procedures in AFMs, or CFMs.

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**A.** When an operator proposes to modify a non-normal or emergency procedure, the operator must show that the modified procedure does not adversely affect the airworthiness of the aircraft. The operator may establish the safety and effectiveness of proposed procedures by analysis, documentation, or validation tests.

**B.** POIs should request guidance from the Director, Flight Operations Division prior to approving the deletion of an item or approving the rearrangement of items on these checklists.

**4.12.3.17. IMMEDIATE ACTIONS.** An immediate action is an action that must be accomplished so expeditiously (in order to avoid or stabilize a hazardous situation) that time may not available for a crew member to refer to a manual or checklist. Crew members must be so familiar with these actions that they can perform them correctly and reliably from memory. POIs must ensure that immediate action situations are included in an operator's AFM or CFM, as appropriate. Situations that require immediate action include, but are not limited to the following:

- Imminent threat of crew member incapacitation
- Imminent threat of loss of aircraft control
- Imminent threat of destruction of a system or component which makes continued safety of the flight and subsequent landing improbable

**A.** Under this criteria, a flight crew donning oxygen masks in response to a depressurization or turning off the fuel and ignition in case of a hot-start are situations requiring mandatory immediate action items. The loss of thrust on a jet engine during cruise, however, would not normally require an immediate action according to these criteria.

**B.** POIs must ensure that immediate action items are explicitly identified as such in an operator's CFM. It is not acceptable for immediate action items to be hidden (not specifically identified as an immediate action) in procedures or checklists.

**C.** Certain situations that either require or appear to require immediate action have proven to be a stimulus for evoking incorrect and often inappropriate flight crew actions. Therefore, immediate action items must be strictly limited to only those actions necessary to stabilize the situation. POIs must ensure that all remaining actions are accomplished by "challenge-do-verify" (CDV) checklists.

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**D.** POIs may approve an operator's proposal to replace immediate action items in an AFM procedure with CDV checklist procedures in a CFM, provided the operator shows compliance with the criteria in this paragraph and also demonstrates an equivalent level of safety through validation tests.

**4.12.3.19. MANDATORY CONFIRMATION ITEMS.** There are certain critical procedural steps that must be confirmed by a second crew member before the step may be taken. POIs must ensure that an operator's procedures which contain such critical procedural actions must clearly identify the critical actions and the crew member who is responsible for providing the confirmation. The types of procedural actions that require this confirmation include the following:

- Actions resulting in the shutting down of an engine
- Actions resulting in the deactivation of flight controls
- Actions that if performed incorrectly, in the wrong sequence, or at the wrong time produce a catastrophic result, even if the incorrect action is not highly likely
- Actions where past experience or analysis has shown that there is a high probability for error or incorrect action and which creates a hazardous situation

**4.12.3.21. CREW MEMBER ROLES.** The CFM must clearly define the various crew member roles and responsibilities. POIs should use the following guidance when ensuring that the operator clearly states policy and guidance for cockpit management in the AFM or CFM, as applicable.

**A. PIC Responsibilities.** The operator's policy and guidance should make it clear that the PIC's primary responsibility is to manage the actions of the crew and the conduct of the flight. While the PIC may delegate the management of the flight and manipulation of the controls to the SIC, the CFM must not indicate that the PIC can delegate the responsibility for safe conduct of the flight.

**B. Responsibilities of Flight Crew members Not in Command.** The operator's flight manual should contain policy and guidance to those flight crew members not in command, as to their responsibilities to the PIC and their responsibilities for the safe conduct of the flight.

**C. SIC Responsibilities.** The CFM must contain guidance for the PIC concerning the conditions and circumstances in which an SIC may operate the aircraft. The operator's policies must

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delineate the limits of authority delegated to the SIC when the SIC is the pilot flying (P-F). The operator's policies should address crew management in critical situations. For example, there may be certain situations in which the SIC should be the pilot-flying (P-F) so that the PIC can concentrate on managing those situations, particularly ensuring that required actions and appropriate checklists are properly accomplished. Procedures for transfer of control must be clearly addressed in the CFM.

**D. Communications.** In general, proper cockpit management requires effective communication and cooperative action between crew members which form consecutive closed loops. A diagram of this interaction is in the illustration in Figure 4.12.3.1.

**E. Coordination.** Research has shown that effective flight crews coordinate their actions before any action is required. POIs shall ensure that CFMs contain a requirement for briefings and also adequate guidance for the content of those briefings.

**Figure 4.12.3.1. Effective Communication and Cooperative Action Between Crew members**



**4.12.3.23. OPERATIONS NOT EVALUATED IN AIRCRAFT CERTIFICATION.** If the operator proposes to conduct operations which have not been evaluated during aircraft certification, the POI

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must ensure that the operator has developed and obtained approval of procedures for the conduct of the proposed operation. Such operations are often indicated by the absence of a procedure for the operation in the AFM. Examples of such operations could include taxi with engine shutdown. POIs should use the following guidance when evaluating those operations not evaluated during aircraft certification.

**A.** POIs must ensure that each operation conducted must be specifically addressed by a procedure. For example, it should not be assumed that a procedure for shutting down and then restarting an engine during a taxi delay is equivalent to a procedure for delaying an engine start on initial taxi-out. The same procedure may not be used for more than one operation unless analysis shows that more than one operation may be safely conducted using the same procedure.

**B.** POIs must ensure that an operational procedure is thoroughly coordinated with appropriate Airworthiness Inspectors. Since adverse effects that an erroneously designed procedure could cause to the airworthiness of an aircraft or its systems may not be immediately apparent, the POI must ensure that coordination with airworthiness is required. For example, a procedure for taxiing with engine shutdown could have a detrimental effect on the landing gear system if high asymmetrical engine thrust is used during sharp turns. If there is any question concerning the effects a procedure may have on the airworthiness of the aircraft, the POI should coordinate with the Airworthiness Engineering Section before granting approval of the procedures.

**4.12.3.25. LIMITATIONS.** POIs must ensure that when operating limitations are incorporated in a CFM, that each limitation was transferred correctly from the AFM. POIs should use the following guidance when evaluating the limitations of an operator's CFM.

**A.** POIs should evaluate the operator's CFM to ensure that all AFM operating limitations are published in the CFM and are clearly identified as AFM limitations. The limitations section of a CFM must contain every limitation from the AFM. Operators may add limitations to CFMs which were not in an AFM limitation. One method of accomplishing this is for the operator to express all operator-imposed limitations as policy statements in applicable procedures. When the operator chooses to blend AFM and operator imposed limitations in the limitations section of a CFM, the POI must ensure that the operator used a method for clearly distinguishing each AFM limitation from the operator-imposed limitations.

**B.** The operator is responsible for informing crew members of all AFM operating limitations. Crew members are responsible for observing all AFM limitations. The POI must ensure that the

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CFM contains a statement that crew members are responsible for being aware of and for observing all limitations.

**4.12.3.27. SELECTED PRACTICES.** POI with certificate management responsibilities shall review their respective operator's operations manuals. This review should clarify under what conditions and circumstances flight crews can make independent determinations about what constitutes a maintenance irregularity or discrepancy regarding departure when maintenance irregularities are noted at non-maintenance stations.

**A.** POIs shall determine whether an operator's operations manuals contain criteria for the responsibilities of flight crews during preflight and postflight inspection, when maintenance irregularities or discrepancies are noted at non-maintenance stations.

**B.** When procedural discrepancies are discovered in the operations manuals POIs should take the necessary action to have those manuals corrected.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 4. Evaluate an Operations Manual for Parts 121, 125, 133 and 135**

**4.12.4.1. GENERAL.** This section contains information, direction, and guidance Principal Operations Inspectors (POIs) should use in the evaluation of an operator's Operations Manual (OM). The operator's OM is a major part of the operator's flight safety document system / manual system. General Authority of Civil Aviation Regulation (GACAR) §§ 121.139, 125.77, 133.61 and 135.85 require that each operator prepare and keep current an Operations Manual. The General Authority of Civil Aviation (GACA) requires that the OM contain guidance for flight, ground, and management personnel that is applicable to the conduct of the operator's operations.

**4.12.4.3. CONTENT OF OPERATIONS MANUALS.** GACAR §§ 121.143, 125.79, 133.63 and 135.85 specify topics that an operator's OM must address and GACAR Part 121 and 135 also prescribe specific organization structure requirements for the OM.

**NOTE:** Additional detailed guidance material concerning the development of an OM can be found in International Civil Aviation Organization (ICAO) Doc. 9376 - Preparation of an Operations Manual.

The operator's OM must contain the duties and responsibilities for each category of employee. This manual must also provide sufficient policy, direction, and guidance to its employees for the safe and efficient performance of their duties. In addition, an operator's OM must address the policies, systems, and procedures necessary to comply with operations specifications (OpSpecs) provisions and safe operating practices. This section contains discussions of selected topics that POIs should look for when evaluating an operator's OM, and which the operator's initial and final compliance statements may require.

##### **A. Manual Development.**

- 1) The manual does not need to be a single volume. The applicant may use several volumes as long as they provide the necessary information. If the operator chooses to use individual manuals, it is recommended that the operator design an over-all table of contents section for the Operations Manual that annotates or positions the individual manuals that are a part of

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the Operations Manual.

- 2) Advisory circulars, preambles to regulations, and other guidance material may be used to assist the applicant in developing a manual. The applicant should use caution when incorporating the text of these documents in to the manual since they are advisory in nature. They may not meet the exact needs of the regulation. Under no circumstances may a manual simply reference an advisory document. It may, however, reference technical documents, such as approved airplane flight manuals.
- 3) Each significant term used in the manual should be defined. The definitions must reflect their intended use and include acronyms or abbreviations unique to the manual or the applicant's operation.

### **B. Types of Operations.**

- 1) *GACAR Part 121*. The operations manual for Part 121, referred to in GACAR § 121.143 must contain at the least the requirements in GACAR Part 121, Appendix G, I., which is further broken down into the following sub-sections:
  - a) General
  - b) Aircraft Operating Information
  - c) Areas, Routes, and Aerodromes
  - d) Training
- 2) *GACAR Part 125*. The operations manual for Part 125, referred to in GACAR § 125.77 must contain at the least the relevant operational requirements found in GACAR § 125.79 to include:
  - a) General
  - b) Aircraft Operating Information
  - c) Areas, Routes, and Aerodromes

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d) Training

3) *GACAR Part 133.* The operations manual for Part 133, referred to in GACAR § 133.61 must contain at the least the requirements referred to in GACAR Part 133.63.

4) *GACAR Part 135.* The operations manual for Part 135, referred to in GACAR § 135.85 must contain at the least the requirements in GACAR Part 135, Appendix A, I., which is further broken down into the following sub-sections:

a) General

b) Aircraft Operating Information

c) Areas, Routes, and Aerodromes.

d) Training

**NOTE:** The requirement to develop an Operations Manual (OM) may not apply to a Part 135 operator of limited size and scope.

**C. Best Practices.** The review, acceptance and approval processes illustrated in this section may be used in reviewing any and all operating manuals that are utilized in any GACAR operating environment. POIs should ensure that operators carefully review the requirements of the specific operating rule under which operations are contemplated, and design their manuals in accordance with those requirements. In each operating environment certain special emphasis items require more planning and effort than other items require in that operating environment.

**D. Manual Review.** The manual is reviewed during the Document Compliance Phase of the certification process.

**NOTE:** Operations Manuals should be designed and reviewed in accordance with the type of operations being contemplated. While all Operations Manuals are generally formatted in the same style and form, there are differences in requirements, differences in services rendered and as a consequence differences in safety concerns. These differences drive differences in the content of Operations Manuals relative to the operations being described.

1) The review of the Operations Manual is to ensure that the manual is not contrary to the

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appropriate regulatory requirements, the operations specifications (OpSpecs) and the operating certificate.

- 2) It is essential that the review process be a coordinated effort rather than an individual aviation safety inspector's (Inspector's) opinion. This will ensure minimum returns to the operator for clarification and expedite the acceptance of the manual.
- 3) The important factor is ensuring regulatory compliance; preoccupation with style and format should be avoided.

**E. Human Factors Principles.** GACAR §§ 121.139(c)(7), 125.77(c)(2) and 135.83(g), require that each OM include human factors principles. GACAR § 133.61(1) requires that the design of the manual must incorporate human factors principles. POIs should review the manuals to ensure that those principles are included in the design of the manuals. For further information on this topic, consult the guidance material on the application of Human Factors principles that can be found in the International Civil Aviation Organization (ICAO) Human Factors Training Manual (Doc 9683).

**F. Manual Revisions.** POIs should encourage operators to discuss manual revisions before they are submitted for acceptance. Revision should not be distributed by the operator until accepted by GACA and returned to the operator with an indication of acceptance (signature and date).

- 1) Revisions must also conform to regulatory requirements. If the revisions are not approved by the GACA before they are printed and distributed, the operator may have to make costly changes should the GACA find a problem with the revision.
- 2) When a printed and distributed manual revision does not conform to the appropriate regulations or the operations specification or operating certificate, the Inspector should immediately notify the operator in writing and request prompt, appropriate action to resolve the problem(s).

**4.12.4.5. OPERATOR MANAGEMENT STRUCTURE.** When evaluating an operator's OM, POIs must ensure that the OM includes the operator's management structure and that it meets the following guidelines:

**A. Management Structure.** The OM must contain a description of the operator's management structure as it pertains to flight operation activities. Organizational entities, areas of

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responsibility, and titles of key management positions must all be identified. The POI must ensure that the Director of Operations is responsible for, and has the authority to direct all operational functions. Furthermore, the GACA requires POIs to ensure that the chief pilot, as well as all operational and support personnel (i.e., training managers and dispatchers), and those persons in the operators operations organization who are in a position to exercise control over operations, ultimately, report to and are accountable to the Director of Operations. Additionally, procedures should be in place to ensure that proper coordination exists between flight operations management and aircraft maintenance management concerning aircraft airworthiness status and maintenance release. Organizational charts and diagrams may be useful in showing the relationship between operational units within the company.

**B. Names of Management Personnel.** The OM must list the names of the individuals filling required management positions. An acceptable way for the operator to meet this requirement is to include a copy of its OpSpecs in the manual.

**4.12.4.7. AUTHORIZED OPERATIONS.** When evaluating an operator's OM, POIs must ensure that the operator's OM meets the following authorization guidelines:

**A. Clear Descriptions of Authorized Operations.** The OM should contain a clear description of the types and kinds of operations that the operator is authorized to conduct. The OM must prohibit those operations that a flight crew could possibly conduct but which the OpSpecs specifically prohibit the operator from conducting. The OM must contain information on the authorized areas of en route operation in which the operator may conduct flights, including the types of aircraft authorized, crew member complements, and any special en route and instrument approach procedure authorizations or requirements. One way an operator may describe the types and kinds of authorized and prohibited operations is to include a copy of the operator's OpSpecs in the OM. Since the OpSpecs address a variety of situations and is not easily understandable as it applies to specific operational circumstances, POIs should encourage operators to extract the applicable information and incorporate it in the OM. Also the operator should include clearly written direction and guidance on how to comply with authorizations and limitations. It is acceptable for operators to contract a charting and publishing service (such as Jeppesen/Sanderson) to prepare manual material concerning these authorizations and limitations. In these cases, consider the charting and publishing service's product to be a part of the operator's OM. POIs must review this portion of the operator's OM as well as all other portions.

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**B. Flight Operations Policies, Methods, and Procedures.** Either the OM, a section of the OM such as a flight operations policy manual, or a Company Flight Manual (CFM) (see Section 1 of this Chapter for a definition of CFM) may contain flight operations policies, methods, and procedures. When an operator operates a variety of aircraft, it may be preferable to publish the flight operations policies, methods, and procedures that are common to all aircraft in the OM instead of each CFM. Crew members are required to comply with the flight operations policies, methods, and procedures, regardless of whether they are in the OM or the CFM. Therefore, flight operations policies, methods, and procedures should be written in directive language, and provide specific operational criteria. An example of a flight operations policy statement that does not provide a clear directive or specific operational criteria is as follows: "Use caution when arriving or departing a terminal area when thunderstorms are present." An example of a flight operations policy statement that is clearly a directive and provides specific operational criteria is as follows: "Takeoffs and landings shall not be attempted when thunderstorms are within three miles of the aerodrome or the path of takeoff or arrival."

**4.12.4.9. MASS AND BALANCE PROCEDURES.** When evaluating an operator's OM, POIs will ensure that an operator includes their mass and balance procedures in the operator's OM and that they meet the following guidelines: (Re GACAR §§ 121.197, 125 Appendix A, I, 133.63 and 135.109)

**A. Placement of Mass and Balance Procedures.** Each type of aircraft the operator uses may require a separate mass and balance procedure. In such cases, it may be appropriate for the operator to place the mass and balance procedure flight crews need in the CFM and the procedures other flight operations personnel need in sections of the OM. If the operator develops a single mass and balance procedure for all aircraft operated, it may be appropriate for the operator to place the procedure flight crews and other flight operations personnel need in the OM. Operators may develop their own mass and balance procedures or use the procedures aircraft manufacturers furnish. POIs should recommend the latest editions of the following ACs to the operator:

- FAA-H-8083-1, Aircraft Weight and Balance Handbook
- FAA AC 120-27, Aircraft Weight and Balance Control

**B. Approval of Mass and Balance Procedures.** OpSpecs grant the approval of mass and balance procedures and the POI will have primary responsibility for authorizing the operations outlined

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in the applicable OpSpecs.

**C. Additional Guidance for Issuing OpSpecs.** Volume 15 of this handbook provides additional guidance for issuing OpSpecs. FAA AC 120-27 (as amended) provides information that will assist the POI in approving an operator's mass and balance control program. An operator may reference the OpSpecs in the OM; however, the operator may not use the reference instead of a detailed description of the procedures flight operations, ground handling, and flight crew personnel need. POIs must ensure that the information and guidance in the operator's OM is consistent with that in the Maintenance Manual (MM). The mass and balance procedures described in the operator's manuals should normally address the following topics:

- 1) Procedures for complying with mass and balance limitations for each type of aircraft.
- 2) Procedures for ensuring that the empty mass and center of gravity of each aircraft is determined by actually weighing the aircraft within the preceding 36 months unless a program for using fleet average mass has been authorized.
- 3) Procedures for determining the mass of passengers, crew, cargo, and baggage.
- 4) Procedures for making the center of gravity calculations, including loading schedules or other approved methods, if applicable.
- 5) Procedures for the completion and disposition of load manifests and mass and balance records.
- 6) Procedures for loading the aircraft.

**4.12.4.11. OPERATIONAL CONTROL.** When evaluating an operator's OM, POIs must ensure that an operator's operational control procedures are included. The OM must include descriptions of the procedures, duties, and responsibilities of flight crew, operational control, and management personnel. Furthermore, the OM must contain staffing requirements for operational control personnel during periods of time that flights are operational. When a training and qualification document does not contain training and operational control requirements for operational control personnel, the OM must list the requirements. The POI must ensure that the operator's OM meets the following requirements:

**A. Part 121 Operations.** The description of the operational control system Part 121 operator's

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use for conducting scheduled operations must be comprehensive. The required manual(s) must contain dispatch release procedures as well as flight release procedures. The manual(s) must also contain a detailed outline of the interrelation of flight dispatch, crew scheduling, and airworthiness control. The manual(s) must address the communication facilities for operational control purposes, procedures with Air Traffic Services (ATS), and methods for handling delayed flights. The manual(s) must also cover procedures used during adverse weather conditions and for discontinuing flight in unsafe conditions. If the operator conducts unscheduled flights, the operator must outline the procedures used (see Volume 4, Chapter 25, Section 2, for more detailed information on flight release systems).

**B. Part 135 Operations.** As a minimum, the description of the operational control system used by Part 135 operators must contain a list of the names and titles of the personnel who the operator authorizes to exercise operational control. If the operator does not elect to establish a dispatch release system, the OM must contain directions to flight crews for filing a GACA flight plan for each flight conducted. Regardless, the operators required flight locating system must be outlined in the OM and identify the procedures that provide the operator with at least the information included in a visual flight rules (VFR) flight plan for each flight operated. The manual(s) must also contain an outline of the procedures that provide the operator with information on the location, date, and estimated time for reestablishing radio or telephone contact when conducting flights in areas where such communications cannot be maintained with the operator. The flight locating system must also be provided for timely notification to a GACA facility and search and rescue facility when an aircraft is overdue or missing. The manual(s) will also contain a description of the procedures for retaining flight location information until a flight is complete. If Part 135 operators use a flight control system that is more sophisticated than the basic requirements of the regulation, the manual(s) will contain a description of the system and procedures actually used (see Volume 4, Chapter 25, Section 4, Part 135 Flight Locating Systems and Operating Rules).

**4.12.4.13. FLIGHT PLANNING.** When evaluating an operator's OM, POIs will ensure that an operator includes their flight planning procedures. The direction and guidance for flight planning must be comprehensive and address the responsibilities of both flight control and flight crew personnel. The manual(s) must contain a discussion of weather minimums, special aerodromes, and other special requirements such as drift-down, rerelease, and diversion contingencies. Some operators may elect to place the flight planning procedures in the CFM (not preferred) and the operational control procedures in a dispatch or flight control user manual.

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**4.12.4.15. NOTICES TO AIRMEN (NOTAM) AND PILOT REPORTS (PIREP).** When evaluating an operator's OM, POIs will ensure that the operator includes procedures for the acquisition of NOTAMs and PIREPs and for the distribution of these NOTAMs and PIREPs to applicable personnel. The OM should also contain a description of the procedures for obtaining applicable NOTAMs that are only distributed to a local area.

**4.12.4.17. RESTRICTED OR SUSPENDED OPERATIONS.** The regulations require operator's knowledge of conditions that preclude safe operations (including hazardous aerodrome and runway conditions) to restrict or suspend operations until those conditions change. POIs must evaluate an operator's OM to ensure that it contains a description of the procedures for employees to follow should they become aware of such conditions.

**4.12.4.19. INTERNATIONAL OPERATIONS.** For an operator that conducts international operations, POIs must evaluate the operator's OM to ensure that it includes pertinent and necessary flight control information. In the OM, the operator should place particular emphasis on fuel and performance requirements, communications, weather reports and forecasts, flight planning, and any specialized means of navigation. POIs should refer to Volume 5 of this handbook for additional information.

**4.12.4.21. OBSERVER'S SEATS.** POIs should ensure that the operator's OM includes the requirement that the operator must provide an observer's seat (jump seat or passenger seat) to GACA Inspectors and other specified personnel. Usually, operators assign the authority to control the use of these observer's seats to a flight control department. Gate agents and passenger handling personnel must also be aware of these requirements. Crew members must also be aware of the procedures to be used for observer seat assignments. The OM must include information to comply with GACAR §§ 121.1145, 121.1153, 121.1157, 121.1161 and 135.595, such as the following:

**4.12.4.23. LINE STATION OPERATIONS.** Line station operations are those activities the operator's personnel performs (or other personnel for the operator) to originate, turn around, or terminate flights the operator conducts. For an operator that conducts line station operations, POIs must evaluate the operator's OM to ensure that it includes the necessary information on the various topics that follow:

A. Line station operations should include the use of the following types of facilities and equipment:

- 1) Ramp areas, including markings, signs, signaling devices, lighting, and blast fences.

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- 2) Ramp facilities and equipment, such as passenger and cargo boarding and deplaning equipment (towing, refueling, catering, and ground power equipment).
- 3) Crew member meeting areas, facilities for crew member flight planning (preparation for flight), and postflight activities.
- 4) Ground station personnel work areas and facilities, communications equipment, and administrative support.

**B.** POIs must ensure that an operator's OM contains the policies, procedures, and guidance that the personnel who are tasked with supporting the operator's flight operations at line stations will need. This manual material must include those situations in which the operator maintains line stations as well as situations in which the operator contracts for or purchases line station support. This type of material is usually within various user manuals, such as ground station operations and maintenance manuals, passenger service manuals, facilities and equipment manuals, fueling manuals, and other special types of manuals. An operator may format and organize this type of manual material in a manner that is most consistent and usable for the operator's kind and type of operation. Regardless of the format and organization, however, consider this type of manual information to be OM material. The following are examples of the types of information that manual material relative to line stations operations should address:

- 1) *Duties and Responsibilities.* The OM or the Maintenance Manual (MM), as appropriate, must contain an outline of the duties and responsibilities of line station supervisory personnel. The types of positions that the OM or MM should address include the following: ground station operations personnel, passenger handling agents, cargo and baggage handling personnel, and aircraft servicing personnel (when not addressed in the MM). When an operator contracts for, or purchases line station support, the OM or MM, as appropriate, must detail the procedures the personnel use providing the support.

**NOTE:** Any reference to the MM and the responsibility to verify its content shall be conducted by the GACA principal maintenance inspector (PMI).

- 2) *Passenger Handling and Protection.* The OM must contain procedures and guidance for ensuring the safety of passengers during line station operations. The following are examples of passenger handling and protection subjects that the OM must address:

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- a) Procedures for passenger boarding and deplaning.
  - b) Procedures for use of jetways, passenger boarding stairs, air stairs, and other types of passenger boarding equipment.
  - c) Procedures to ensure the safety of passengers on the ramp, including restricting of ground equipment and vehicle operation on ramps; and directing passengers to and from aircraft, around equipment, and to painted pathway lines on the ramp.
  - d) Procedures and guidance for protecting passengers from jet intake and blast, rotating and static propellers and rotors, ice on the ramp and boarding equipment, and tripping hazards.
  - e) Procedures for prohibiting smoking in no-smoking areas.
  - f) Procedures for assisting and ensuring safety of handicapped persons.
  - g) Procedures for handling hostile or unruly persons.
  - h) Procedures for handling and controlling carry-on baggage.
  - i) Procedures for exit seating.
  - j) Procedures for identifying and handling dangerous goods. (See paragraph 4.12.4.25, following)
- 3) *Aircraft Servicing and Ramp Operations.* The OM and MM must contain detailed safety procedures and guidance on servicing and maintaining aircraft during line station operations. These manuals should also contain instructions on the maintenance and use of ramp areas. The following are examples of procedures for aircraft servicing and ramp operations that the OM should address:
- a) Procedures for the safety and protection of personnel working on the ramp.
  - b) Procedures and/or guidance for the maintenance and catering of aircraft, with or without passengers on-board.

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- c) Procedures for fueling aircraft with or without passengers on-board, including any requirements for crew members to be on board during fueling, or prohibitions against positioning fuel trucks next to open exits with passengers on board.
  - d) Procedures for operating ground equipment, including the capabilities and limitations of the equipment, and the training and qualification of persons using the equipment.
  - e) Procedures and guidance for properly locating and stowing ground equipment.
  - f) Procedures for the operation of aircraft cargo doors, baggage and cargo loading, closing and checking the security of doors.
  - g) Procedures for foreign object damage (FOD) control and periodically inspecting ramp areas.
  - h) Procedures for adverse weather conditions such as thunderstorms, high winds, or low visibility.
  - i) Procedures for the inspection and removal of frost, ice, snow, or standing water.
- 4) *Hot and Cold Weather Operations.* Principal inspectors (PIs) should evaluate an operator's OM to ensure that it (as well as the MM) contains detailed procedures and guidance on hot and cold weather operations, including the following:
- a) Procedures for the inspection of ramps for accumulation of frost, ice, snow, sand, dust, or standing water.
  - b) Precautions for the operation of vehicles and equipment.
  - c) Restrictions and cautions on aircraft movements.
  - d) Restrictions and cautions for the protection of passengers and ramp personnel.
- 5) *Sandstorm Procedures.* Aircraft marshaling procedures should be clearly delineated by the operator. While such procedures are usually in the operator's manual, the MM must contain the following types of information concerning sandstorm protection for crew

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members, ground maintenance, and management personnel, aircraft and other equipment:

- a) Assignment of responsibility for ensuring that company aircraft are either ferried (fly away procedures) out of the area or made secure from the effects of dust, sand and other debris.
- b) Conditions that require implementation of sandstorm procedures.
- c) Parts of the aircraft requiring emphasis, such as flight control surfaces, intakes, nacelles, pitot systems, etc.
- d). Locations on the ramps or aerodromes where aircraft and equipment may be hangered or marshaled.
- e). Engine auxiliary power unit (APU) and ground equipment operation during storm conditions.

6) *Deicing Procedures.* The operator should clearly delineate aircraft ground deicing procedures. While such procedures are usually in the MM, the operator's OM must contain the following types of information concerning deicing for crew members, ground operations, and management personnel:

- a) Assignment of responsibility for ensuring that aircraft is clear of frost, ice, and snow accumulation.
- b) Conditions that require aircraft ground deicing.
- c) Procedures to ensure the effectiveness of deicing, including the frequency of applications, proper fluid mixtures, and tactile or close visual checks of selected portions of critical surfaces.
- d) Parts of the aircraft to deice, including a description of the critical surfaces of the aircraft the operator uses.
- e) Locations on the ramps or aerodromes where deicing will be conducted.
- f) Engine auxiliary power unit (APU) and ground equipment operation during deicing.

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- g) Passenger and ramp personnel protection during deicing.
- h) Procedures contract personnel use when the operator contracts for deicing services.
- i) If applicable, a complete description of the elements of the operator's ground deicing/anti-icing program and the procedures required to operate under that program.
- j) If applicable, a complete description of the ground deicing/anti-icing operational procedures that the operator uses to comply with GACAR § 121.1213, 121.1217, 125.465 and 135.671. GACAR § 91.197 is applicable to Part 133 operations where icing conditions are a concern. Also any applicable material in trade journals or local knowledge, relative to any other adherents to wings and flight control surfaces should be considered.

7) *Aircraft Movement in the Ramp Area.* PIs must ensure that the operator carefully coordinates their procedures and guidance for the movement of aircraft in the ramp area between the operator's OM and MM (or appropriate user manuals). The definitions of signaling devices, signs, and ramp markings (such as taxi lines, stop lines, boundary and clearance lines) must be the same, and both crew members and ground handling personnel must mutually understand them. The OM (or in an applicable user manual) must provide specific procedures for engine start, pre-taxi pushback, taxi-out, taxi-in, and parking while in the ramp area. Communication procedures for ground handling personnel and crew members must be thoroughly coordinated. POIs must ensure that the interphone terminology and hand signals ground handling personnel and crew members' use have the same meaning. The need for common terminology and hand signals is also important for crew members and passenger handling agents. The OM and MM (or appropriate user manuals) should provide illustrations of standard hand signals and their meanings. The appropriate manuals must describe the training and qualification requirements of personnel authorized to move aircraft on the ramp or on the aerodrome.

8) *Line Station Emergency Procedures.* PIs must ensure that the operator's OM and MM contain procedures used by crew members or ground personnel in case of emergency situations during line station operations. Line station emergency procedures must contain the specific duties and actions of appropriate personnel. This type of manual material must also include notification procedures and requirements. The notification procedures and requirements should contain specifications as to who to notify, who will make the

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notification, how to make the notification, and when to make it for the various types of emergency situations that could occur at line stations. Usually this type of manual material should also include a quick reference telephone listing for obtaining fire-fighting and medical assistance, and for notifying appropriate company management, law enforcement officials, and GACA and AIB officials. Line station emergency procedures should be published in a distinct section of the OM or MM so that they are easily accessible. For large, complex operators, line station emergency procedures are usually published as a manual under separate cover to ensure rapid accessibility. Operators should publish a line station emergency procedure manual for each station, because of the uniqueness of each line station environment. POIs should encourage this as a preferred practice. Line station emergency procedures should cover the following types of situations:

- a) Aircraft accidents and incidents. POIs should encourage operators to develop guidance for ground personnel providing passenger lists to aid in handling passengers and accounting for all passengers immediately after a survivable type accident. Handling passengers includes actions such as providing suitable transportation for injured passengers to locations where medical assistance can be obtained; and further considerations for:
  - 1. Bomb threats, hijack procedures, and other types of security incidents.
  - 2. Fuel spills and dangerous goods (hazardous materials) mishaps.
  - 3. Procedures for post-flight handling of passenger injury, illness, or incidents involving passenger altercations and interference with crew members.
  - 4. Employee/passenger accidents and injuries.
  - 5. Adverse weather conditions, such as tornadoes and hurricanes or other adverse conditions such as earthquakes (if such conditions are likely to occur at the operator's line stations).
  - 6. Emergency evacuation of aircraft while parked (This should include procedures for both the flight crew and cabin crew members to activate the aircraft emergency lighting systems during an emergency evacuation, regardless of the perceived ease with which an evacuation can be accomplished; and passenger egress procedures for crew members and other operations personnel. These procedures should include

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the requirement that whenever passengers are on-board the aircraft before airplane movement on the surface, that at least one floor-level exit must be usable for the egress of passengers through normal or emergency means.).

7. Aircraft rescue and fire-fighting (ARFF) emergency notification procedures while parked (POIs will encourage their assigned operators to develop explicit ARFF emergency notification procedures for crew members and other operations personnel to employ in the event of an emergency occurrence on their aircraft while they are parked).

**NOTE:** ARFF notification procedures apply to situations where ARFF equipment is both on and off aerodromes. These procedures should include information concerning:

- Whom to notify (such as aerodrome fire department, aerodrome control tower, alternate facility if control tower is closed).
- The means of notification (such as jetway telephone, including ARFF telephone numbers; and aircraft radio communication system, including ARFF radio frequencies).
- The persons by job title whom the operator determines will implement notification procedures in the event of an emergency occurrence on the operator's aircraft.

8. For passenger-carrying operations, if the operator's ARFF procedures require its crew members to implement these procedures, then the operator should include those procedures in the OM.

9) *Contract Services.* PIs must ensure that the OM and MM, as appropriate, contain policy and guidance concerning the interrelationship between the operator's personnel and the personnel of organizations who provide contract services at line stations. Contractor personnel are required to be trained on operator-specific procedures. The appropriate manual must contain the specifications for the following: the types of training given to contractor personnel, who is responsible for providing the training, and who is responsible for keeping records of the training. Although the contractor may be delegated this responsibility, the operator has final responsibility.

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10) *Trip Records.* POIs must ensure that the operator's OM contains policies, procedures, and guidance concerning the preparation and disposition of trip records at line stations. Trip records include documents such as dispatch and flight releases, flight plans, weather, NOTAMs, oceanic plotting charts, load manifests, and mass and balance documents. The manual material must specify who is responsible for preparing the trip records, the coordination activities that must be accomplished during the trip record preparation process, and the intermediate and final disposition of the trip records. The POI must ensure that the policies, procedures, and guidance in this manual material consistently contain accurate information for crew members and flight operational control personnel.

11) *Local Conditions at Line Stations.* Personnel at line stations have immediate access to and knowledge of various conditions and activities that could affect flight operations at those line stations. Examples of local conditions and activities include the following: weather conditions, runway and taxiway conditions, aero-meteorological construction activities, and new obstacles observed in the aerodrome takeoff flight paths. As such, Inspectors must ensure that an operator's OM contains instructions and procedures so that line station personnel can provide the operator with local condition reports. This manual material must contain clear instructions about the circumstances in which line station personnel are authorized to suspend or delay flight operations.

**4.12.4.25. TRANSPORTATION OF DANGEROUS GOODS PROCEDURES.** Approval of procedures concerning transportation of dangerous goods must be carried out in accordance with the requirements prescribed in GACAR Part 109 and Subpart R of Parts 121, 125 and 135. See Volume 4, Chapter 31, Transportation of Dangerous Goods by Air, for additional guidance.

**4.12.4.27. PASSENGER BRIEFING PROCEDURES.** POIs must ensure that the operator's OM specifies the procedures to be used for pre takeoff, en route, and post landing briefings of passengers. Operators who use cabin crew members (CCM) may publish CCM user manuals (CCMMs) as sections of their OMs. The OM or CCM user manual must contain the briefings to be given. Passenger briefing cards must be used to supplement the oral briefings. These passenger briefing cards must depict all of the required items that the oral briefings addressed. FAA AC 121-24 (as amended), Passenger Safety Information Briefing and Briefing Cards, contains guidance on passenger safety information and briefing cards.

**4.12.4.29. Accident Notification Requirements.** The Aviation Investigation Bureau (AIB) requires operators to notify, immediately and in the most expeditious manner, of accidents and overdue aircraft.

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The operator must develop procedures which accomplish this.

- 1) The manual should include a copy of the AIB Regulations and procedures and any appropriate Aviation Security Directives.
- 2) Also included should be the names and telephone numbers of the appropriate operator personnel who must be notified.

### **4.12.4.31. CODE SHARE SAFETY PROGRAM GUIDELINES.**

- A.** The General Authority of Civil Aviation (GACA) addresses safety issues associated with code sharing, directly, within the regulatory structure, i.e., within the operating rules, e.g., GACAR §121.25.
- B.** Each operator who implements a code-share agreement with a foreign operator must establish and maintain a code-share safety-monitoring program acceptable to the President. Safety audits of the code share partner may be conducted in accordance with the International Air Transport Association (IATA), Operational Safety Audit Standard or another standard acceptable to the President. Audits must be performed at least every two years by an auditing agency acceptable to the President.
- C.** Each Principal Operations Inspector (POI) will determine that an accepted audit program of his operator has been incorporated into the manual required by GACAR § 121.139.
- D.** Following the date of incorporation of the audit program into the operator's manual, POIs will determine that the accepted audit program is reviewed for currency at least once during each two year period thereafter. If the audit program is not current, the POI should provide the necessary follow-up actions to ensure currency and enter the date of the revision to the manual required by GACAR § 121.139, thereby ensuring that an acceptable level of safety is maintained by the code share partner.

### **4.12.4.33. RAPID REFUELING OF ROTORCRAFT.** Inspectors should consider the following requirements when evaluating an operator's procedures for the rapid refueling of rotorcraft with and without passengers on board.

- A. Refueling Procedures.** Operators may need to conduct operations such as the refueling of a rotorcraft with the engine running, rotors turning, or with passengers on board. Before

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conducting such operations, the operator must develop procedures acceptable to the POI and publish these in the operator's Operations Manual (OM). The operator must train and qualify all applicable personnel in these procedures before conducting such operations.

- 1) Only turbine engine rotorcraft using fuels that have a flash point equal to or greater than JET A or JET A-1 fuels should be fueled while an engine is operating.
- 2) Rotorcraft being refueled while an engine is operating should have all sources of ignition of potential fuel spills located above the fuel inlet port(s) and above the vents or tank openings. Sources of ignition include, but are not limited to, engines, exhausts, auxiliary power units (APUs), and combustion-type cabin heater exhausts.
- 3) The operator should only permit rotorcraft fueling while engines are operating under the following conditions:
  - a) A GACA certificated rotorcraft/helicopter pilot should be at the aircraft controls during the entire fuel servicing process.
  - b) Passengers should be off-loaded to a safe location prior to rapid refueling operations. Where the pilot in command deems it necessary for passengers to remain on board for safety reasons, the provisions of subparagraph 4.12.4.27, B, below, Evacuation Procedures, should apply.
  - c) Passengers should not load or off-load during rapid refueling.
  - d) Only designated personnel, properly trained in rapid refueling operations, should operate the equipment. Written procedures should include the safe handling of the fuel and equipment.
  - e) All doors, windows, and access points allowing entry to the interior of the helicopter that are adjacent to, or in the immediate vicinity of, the fuel inlet ports should be closed and should remain closed during refueling operations.
  - f) Before placing fuel into the rotorcraft, the rotorcraft should be bonded to the fuel source to equalize static electricity between the fuel source and the aircraft.

**NOTE:** Grounding of the aircraft and/or fuel truck is no longer recommended because it does

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not prevent sparks at the fuel source, and the grounding cable may not be sufficient to discharge the electrical current.

- g) Fuel should be dispensed into an open port from approved deadman-type nozzles, with a flow rate not to exceed 10 gallons per minute (38 liters per minute), or it should be dispensed through close port pressure fueling ports.
- h) An appropriate type fire extinguisher of an appropriate size for the refueling operation must be within easy reach of the refueling personnel at all times during rapid refueling operations.

**B. Evacuation Procedures.** An operator's refueling policies and procedures should include any special considerations for the evacuation of passengers in case of emergencies. Inspectors should consider the following requirements when evaluating an operator's procedures for evacuation of passengers during rotorcraft rapid refueling.

- 1) If passengers remain on board the aircraft during fuel servicing, at least one qualified person trained in emergency evacuation procedures should be in the aircraft at or near a door at which there is a passenger loading walkway, integral stairs that lead downward, or a passenger loading stair or stand.
- 2) A clear area for emergency evacuation of the aircraft should be maintained adjacent to not less than one additional exit.
- 3) If fueling operations take place with passengers on board away from the terminal building and stairways are not provided, such as during inclement weather (diversions), the operator should notify the Aerodrome Rescue and Fire Fighting (ARFF) services to assume a stand-by position in the vicinity of the fueling activity with at least one vehicle.
- 4) The aircraft operator should establish specific procedures covering emergency evacuation under such conditions for each type of aircraft they operate.
- 5) All "no smoking" signs should be displayed in the cabin(s), and the no smoking rule should be enforced. For aircraft without closed refueling systems, the operator should use "no smoking" placards or temporary signs as opposed to lighted "no smoking" signs.

### 4.12.4.35. AIRCRAFT GROUND TOWING PROCEDURES.

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**A. Towbar and Towbarless Towing.** When towing aircraft, the operator must use the proper tow-bar and/or tow vehicle. The wrong type of tow-bar, or makeshift equipment, can cause damage to the aircraft. Persons performing towing operations must be thoroughly familiar with the procedures that apply to the type of aircraft to be moved and the type of tow vehicle. Recommend the current edition of the following ACs to the operator.

- AC 00-65, Towbar and Towbarless Movement of Aircraft
- AC 150/5210-5, Painting, Marking, and Lighting of Vehicles used on an Aerodrome
- AC 150/5210-20, Ground Vehicle Operations On Aerodromes.

**B. Towbarless.** The mass of an aircraft is a major consideration during towing because handling characteristics of the towbarless tractor change proportionally with the change in aircraft mass. Heavier aircraft put more stress on this vehicle and after movement begins, heavy aircraft can “push” the tug with a greater force than lighter aircraft because of mass, momentum, and the fuel load of the aircraft. Tow operators must recognize and understand these characteristics. Heavier masses and too much speed create the potential for serious accidents. Therefore, operators should reduce towing speeds according to the mass of the aircraft. The braking distance required to stop a large aircraft will be greater than the distance required to stop a small aircraft.

**C. Towing Vehicle Inspections.** Tow vehicle operators must ensure all towing equipment is serviceable and functioning properly before starting any towing operation. Before connecting the towbar to the aircraft, the tow vehicle operator should inspect the tow vehicle for defects or extraneous material that may interfere with safe operation. An operator must inspect each tow vehicle at least once each shift to verify that the cab and exterior of the vehicle are clear of all extraneous materials and the vehicle is in safe working condition. Additionally the operator should check all radio communications before dispatching a tow vehicle. When tow vehicle operators find mechanical defects affecting safety on tow vehicles, the operator should take the equipment out of service and send it to vehicle maintenance for repairs.

**D. Towing Operations.** Using trained personnel, following established procedures and properly planning for weather, local conditions such as inclined ramps, emergencies, and other limitations should prevent mishaps. For maximum safety, towing personnel must not place themselves in the direct path of aircraft wheels nor ride on any external portion of an aircraft or tow vehicle. Towing personnel should use a checklist and ensure placards are serviceable and located inside the tow vehicle cab to identify any restrictions that apply to the tow vehicle. Towing personnel should

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observe any other placards that might be of a temporary nature prior to all movements. When connecting a tow bar to any tow vehicle, personnel must stand clear until the backing tow vehicle is in close proximity to the towbar. When connecting a tow vehicle, personnel must be extremely vigilant to any sudden movement of the tow vehicle or aircraft.

**E. Personnel Training.** Operators should ensure that aircraft ground handling personnel are thoroughly familiar with all published towing procedures pertaining to the type of aircraft being towed along with understanding the restrictions and/or limitations on any vehicle authorized to move an aircraft. Newly assigned aircraft maintenance specialists/ground vehicle operator personnel must pass a proficiency test on the types of aircraft towed and types of tow vehicles, after completing supervised on-the-job training (OJT). Wing and tail walkers may not have to be familiar with all published towing procedures or receive annual proficiency training if their duties are restricted to these positions during towing operations. The tow team leader should clearly define duties and responsibilities and the use of a checklist covering all items pertaining to the safe movement of the type aircraft being towed, and he must brief all team members prior to the aircraft being moved. The operator's procedures manual should cover this information. All operators of tow vehicles in the aerodrome operations area must be trained and possess a valid airside driving permit, usually issued by the aerodrome authority, before being granted access in movement and safety areas when performing towing operations. This requires recurrent training on the following topics: typically consisting of aerodrome signage, limitations, and air traffic and/or ground control communications procedures. Tow vehicle operators must complete the training prior to the initial performance of such duties and at least once every 12 consecutive calendar-months. If the employee can demonstrate the ability to write, explain the intent of a selected reading, and read back simulated communications with little or no hesitation and/or misunderstanding, he will have satisfactorily met the intent of the English language requirement.

**F. Aircraft Movement.** Prior to movement of any aircraft, the operator should comply with the requirements of GACAR § 91.173, which states in part; “No person may park or move an aircraft in, or in dangerous proximity to, a night flight operations area of an aerodrome unless the aircraft: (i) Is clearly illuminated;” (which means that the location of the wingtips and tail of the aircraft must be visible by alternate means of illumination the same as if the aircraft position lights were turned on); or “(ii) has lighted position lights.” The aircraft position lights may be powered by the aircraft battery, APU, or an external power source such as the tow vehicle. Also the tow operators should ensure that all landing gear struts and tires are properly inflated and brake pressure is built up when applicable.

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**G. Flightdeck/Cockpit Observer.** A trained person should be in the pilot's seat to operate the aircraft's brakes if needed. If the hydraulic pressure that provides braking drops below safe operating limits, the operator should terminate the towing operation. Additionally, the observer serves as backup to any communications failures between tow driver and control tower/ramp control.

**H. Tow Vehicle Operator.** The tow vehicle driver is responsible for operating the vehicle in a safe manner. The vehicle operator must obey emergency stop instructions given by any team member. The vehicle operator must be at the controls of the towing vehicle at all times during aircraft movement. The tow vehicle must be connected in a manner which will allow the vehicle driver to face the direction of travel while seated. The vehicle operator must stop the vehicle upon losing communication with the cockpit observer, control tower, and/or ramp control.

**I. Wing Walker.** The operator should station a wing walker at each wingtip to ensure adequate clearance of any obstruction in the path of the aircraft. The wing walker is responsible for properly signaling the tow vehicle operator as soon as it appears the aircraft is in danger of colliding with an obstruction. In such cases, the vehicle operator should stop towing until he personally checks the clearance. Wing walkers are not required for helicopters being towed with rotor blades in the parallel position. Wing walkers do not require annual proficiency testing and need not be fully trained in all towing procedures as long as this is their only task. Thorough pre-tow briefings by the tow team lead will satisfy the training requirement.

**J. Tail Walker.** The operator should use a tail walker during towing operations when you turn the aircraft sharply or back into position. The tow operator should avoid backing of aircraft as much as possible. Tail walkers do not require annual proficiency testing and need not be fully qualified in all towing procedures as long as this is their only task. Thorough pre-tow briefings by the tow team lead will satisfy the training requirement.

**NOTE:** When towing small aircraft, the operator may eliminate the tail walker at the discretion of the tow team lead.

**K. Personnel Riding or Walking.** Under no circumstances should personnel walk between the nose wheel of an aircraft and its towing vehicle, nor should they ride on the outside of a moving aircraft, on the towbar, or on the outside of the vehicle unless in an authorized seat. No person should attempt to board or leave a moving aircraft or towing vehicle.

**L. Night Crew Signals.** Operators should issue two luminous wands to towing team members

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who require wands. Other tow team members should use wands, as required, to warn any aircraft traffic that may approach. Additionally, before any aircraft is moved, the operator should ensure that aircraft position lights are operational.

**M. Control Tower Clearance.** Before proceeding to tow an aircraft on or across an established taxiway or runway, the tow vehicle operator must obtain clearance from the control tower. At no time should any aircraft be towed on or across runways or taxiways without advance approval of the control tower. The primary means of communication will be the aircraft radio. An alternate method (when conditions restrict aircraft battery operation) is through an escort vehicle in direct radio contact with the control tower. The radio-equipped escort vehicle will accompany the aircraft throughout the towing operation.

**N. Towing Speed.** Towing speed should not exceed that of walking team members, with a maximum of 12 kilometers per hour.

**O. Brakes.** To prevent serious mishaps, the operator should charge aircraft brake systems before each towing operation, and stop towing immediately if brake pressure drops below safe operating limits. The tow vehicle operator should not tow aircraft with faulty brakes, except to repair facilities, and then only with personnel standing by ready with chocks for emergency use.

**P. Tow Bars.** Before moving any aircraft, the operator should inspect the towing vehicle, towbar, towbar connections, and other associated equipment for defects, using only authorized equipment in good condition in towing operations.

**Q. Chocks.** The operator should make chocks immediately available in case of emergency throughout towing operations. The operator should place them properly before disconnecting the towing vehicle. When an operator tows or parks aircraft with snow, ice, or frost present anywhere on the parking ramp or towing surface, he should use sand bags and chocks. The operator should use heavier tow vehicles with chains to improve starting and stopping traction during tow operations on ice or snow-covered towing surfaces. The operator should not place or hang chocks or other support equipment on any part of the aircraft exterior during towing or repositioning.

**R. Starts and Stops.** When moving aircraft, tow vehicle operators should not stop and start suddenly. Operators should never apply aircraft brakes when an aircraft is being towed, except in emergencies and upon instructions given by any team member. Before disconnecting the towing vehicle from the aircraft, the operator should stow chocks properly in place and set the aircraft's

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brakes.

**S. Equipment, Stands, and Similar Materials.** The operator should ensure removal and proper storage of all equipment, work stands, loose aircraft parts, and other materials from the vicinity of an aircraft.

**T. Entrance Doors, Ladders, and Down Locks.** To avoid possible worker injury and aircraft damage during towing operations, the operator should close entrance doors, retract or remove ladders, and install landing gear down locks (if required). The only allowable deviations from these requirements are those allowed by specific aircraft manufacturer instructions.

**U. Struts and Tires.** Prior to towing any aircraft, towing team members should check nose and main landing gear struts and tires for proper inflation. Unless the applicable manufacture instructions require a gauge check, a visual check of tires and struts is adequate for towing purposes.

**V. Towing Aircraft without Access to Cockpit.** When moving an aircraft with no cockpit observer (if applicable, such as small aircraft) the operator should make sure chocks are immediately available throughout towing operations in case of an emergency.

**W. Engine Operation.** As a general rule, the operator should not tow aircraft with engines operating. The following exceptions apply to aircraft towing operations with engines running: pushing aircraft away from terminal gates used by airlines for dispatch. Ensure the operator has developed procedures for personnel so that they keep away from rotating propellers and the danger zones of jet engines.

### 4.12.4.37. REFERENCES.

#### A. References.

- GACAR Parts 91, 121, 125 and 135
- GACA Aviation Security Regulations
- FAA AC 91-23A, Pilot's Mass and Balance Handbook
- FAA AC 120-27A, Aircraft Mass and Balance Control

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**4.12.4.39. FUTURE ACTIVITIES.**

- A.** Routine surveillance of operator after acceptance of the manual to assure operations conform to the policies and procedures depicted in the manual.
- B.** Amendments to the manual.
- C.** Revision and Amendments.
- D.** Compliance enforcement actions if the operator is found not conforming to the manual's procedures and policies.

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#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 5. Evaluate a Maintenance Manual (MM)**

###### **4.12.5.1. GENERAL.**

A. This section contains information, direction, and guidance to be used by principal maintenance inspectors (PMIs) in the evaluation of an operator's Maintenance Manual (MM). The operator's MM is a segment of the operator's flight safety documents system / manual system. General Authority of Civil Aviation Regulations (GACAR) §§ 121.143(b), 125.79(b), 133.61(a)(4) and (7), (See NOTE below) and 135.85(b) require that each operator prepare and keep a current MM. The MM, must contain, as a minimum, the contents listed in Part 121 Appendix G, II; and Part 135 Appendix A, II, respectfully. The General Authority of Civil Aviation (GACA) requires the MM to contain guidance and procedures for ground and management personnel's use when controlling and/or conducting maintenance under the operator's maintenance program or when conducting maintenance.

**NOTE:** GACAR Part 133 operators may design an Operations Manual that includes all maintenance items in that manual, properly annotated. They may also design that part of the manual, separating the maintenance items and collating them in a Maintenance Manual. If that is done, then the Maintenance Manual should include all items relative to GACAR §133.61 (a), (4) and (7).

B. The operator's MM must contain the duties and responsibilities for each category of employee associated with the maintenance program. This manual must also provide sufficient policy, direction, and guidance to its employees for the safe and efficient performance of their duties. In addition, an operator's MM must address the policies, systems, and procedures necessary to comply with maintenance OpSpecs requirements and provisions and safe operating practices. This section contains discussions of selected topics that PMIs should look for when evaluating an operator's MM, and which may be required by the operator's initial and final compliance statements.

**NOTE:** The material in this section applies to all the evaluation of all maintenance manuals under the GACAR operating rules.

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### 4.12.5.3. PROCEDURES.

**A. Review Operator's Management Structure.** When evaluating an operator's MM, PMIs must ensure that the operator's management structure is included in the MM and that it meets the following guidelines:

- 1) *Management Structure.* The MM must contain a description of the operator's management structure as it pertains to the Continuous Airworthiness Maintenance Program (CAMP), if applicable and its responsibility for the airworthiness of its aircraft. Organizational entities, areas of responsibility, and titles of key management positions must all be identified in the management structure. This description should contain information on how the maintenance management structure interfaces with the quality management structure and the responsibilities of both. Organizational charts and diagrams may also be useful in showing the relationship between operational units within the company.
- 2) *Names of Management Personnel.* The MM must list the names of the individuals filling required maintenance management positions. An acceptable way for the operator to meet this requirement is to include a copy of their OpSpecs in the manual.

**B. Verify Inclusion of Authorized Maintenance.** When evaluating an operator's MM, PMIs must ensure that the operator's authorized maintenance is included in the operator's MM, and that it meets the following guidelines:

- 1) *Clear Descriptions of Authorized Maintenance.* The MM must contain clear descriptions of the types and level of maintenance that the operator is authorized to conduct under its operating certificate. One way an operator may describe the scope of its CAMP (if applicable), which should include the types and kinds of authorized and prohibited maintenance, is to include a copy of the operator's Operations Specification (OpSpec) D72 in the MM. Since the OpSpecs are designed to address a variety of situations, the PMI should encourage operators to extract the applicable information and incorporate it in the MM. Clearly written direction and guidance on how the operator will comply with the authorizations and limitations should also be included.
- 2) *Inclusion of Organization Charts, Programs, and Information Retrieval Systems.* PMIs must review and insure the manual has all the following required information:
  - a) A chart or description of the operator's organization referred to under GACAR §§

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121.675, 125.305, 133.105 and 135.239 a list of persons with whom it has arranged for the performance of any of its required inspections, other maintenance, preventive maintenance, or alterations, including a general description of that work.

b) The programs referred to under GACAR §§ 121.679, 125.309, 133.109 and 135.245 must be followed in performing maintenance, preventive maintenance, and alterations of that operator's airplanes, including airframes, aircraft engines, propellers, appliances, emergency equipment, and parts thereof.

**C. Review Manual for Mass and Balance Procedures.** When evaluating an operator's MM, PMIs shall ensure that an operator's mass and balance procedures are included in the operator's manual system. If the operator elects to place the mass and balance system program in the MM, that portion of the manual must be the "procedures" portion. Each type of aircraft used by the operator may require a separate GACA approval. The PMI shall verify that the following guidelines are met:

1) *Placement of Mass and Balance Procedure.* It may be appropriate for the operator to place the mass and balance procedure to be used by flight crews in the flight crew operating manual and the procedures to be used by other than flight crew, such as maintenance personnel, in sections of the MM. If the operator develops a single mass and balance procedure for all aircraft operated, it may be appropriate for the operator to place the procedure to be used by flight crews and other maintenance personnel in the MM. Operators may develop their own mass and balance procedures or use the procedures furnished by aircraft manufacturers. PMIs should recommend to the operator the following guidance:

- Federal Aviation Administration (FAA) Advisory Circular (AC) 43.13 2 (as amended), Acceptable Methods, Techniques and Practices—Aircraft Alterations
- FAA AC 91-23 (as amended), Pilot's Weight and Balance Handbook
- FAA AC 120-27 (as amended), Aircraft Weight and Balance Control

2) *Approval of Mass and Balance Procedures.* Approval is granted in OpSpec E94 or E96 (as applicable). Reference to the OpSpecs may be made in the MM; however, the reference may not be used instead of a detailed description of the procedures to be used by ground maintenance, ground handling, and flight crew personnel. PMIs must ensure that the

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information and guidance in the operator's MM is consistent. The mass and balance procedures described in the operator's manuals should normally address the following topics:

- a) Procedures for complying with mass and balance limitations for each type of aircraft.
- b) Procedures for ensuring that the empty mass and center of gravity of each multiengine aircraft is determined by actually weighing the aircraft within the preceding 36 months unless a system based on average fleet masses is authorized.
- c) Procedures for determining the mass of passengers, crew, cargo, and baggage.
- d) Procedures for making the center of gravity calculations, including loading schedules or other approved methods, if applicable.
- e) Procedures for the completion and disposition of load manifests and mass and balance records.
- f) Procedures for loading the aircraft.

**D. Review Operational Control Procedures.** When evaluating an operator's MM, PMIs must ensure that an operator's maintenance control procedures are included. Other areas should be explained as well, such as duties and responsibilities of the maintenance control supervisor. The MM should also explain the relationship between maintenance control and operations dispatch. It should further explain that only a licensed dispatcher could dispatch an aircraft. When training and operational control requirements for operational control personnel are not contained in a training and qualification document, they must be listed in the MM. The PMI must ensure that the following requirements are met:

- 1) *Part 121 Operations.* The description of the operational control system used by GACAR Part 121 operators conducting scheduled operations must be comprehensive. The interrelation of flight dispatch, crew scheduling, and maintenance (airworthiness) control must be outlined in detail.
  - a) Maintenance Planning. When evaluating an operator's MM, PMIs shall ensure that maintenance-planning procedures are included. The direction and guidance for maintenance planning must be comprehensive and address the responsibilities of both

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maintenance control and quality control.

2) *Policies, Procedures, and Guidance.* Inspectors must ensure that an operator's MM contains the policies, procedures, and guidance to be used by the personnel who support the operator's maintenance efforts at the outlying line station level. This manual material must include those situations in which the operator maintains line stations as well as situations in which the operator contracts for or purchases line station support. This type of material is usually located throughout various user manuals, such as ground station and maintenance manuals, facilities and equipment manuals, fueling manuals, and other special types of manuals. An operator may format and organize this type of manual material in a manner that is most consistent and usable for the operator's kind and type of operation. Regardless of the format and organization, however, this type of manual information is considered to be MM material. The following are examples of the types of information that should be addressed in manual material concerning line station maintenance.

- a) Duties and Responsibilities. The MM, as appropriate, must contain an outline of the duties and responsibilities of line station supervisory personnel. The types of positions that should be addressed include the following: ground station maintenance personnel, and aircraft servicing personnel (when not addressed in the OM). When an operator contracts for or purchases line station support, the MM, as appropriate, must detail the procedures to be used by the personnel providing the support.
- b) Servicing and Ramp Maintenance. The MM must contain detailed safety procedures and guidance on servicing and maintaining aircraft during line station maintenance. These manuals should also contain instructions on the maintenance and use of ramp areas. The following are examples of procedures for aircraft servicing and ramp maintenance that should be addressed in the MM:
  - Procedures for the safety and protection of personnel working on the ramp
  - Procedures for fueling aircraft with or without passengers onboard, including any requirements for crew members to be onboard during fueling, or prohibitions against positioning fuel trucks next to open exits with passengers onboard
  - Procedures for operating ground equipment, including the capabilities and limitations of the equipment, and the training and qualification of persons using the equipment

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- Procedures and guidance for properly locating and stowing ground equipment
  - Procedures for the operation of aircraft cargo doors, baggage and cargo loading, and closing and checking the security of doors
  - Procedures for foreign object damage control and periodically inspecting ramp areas
  - Procedures to be used during adverse weather conditions such as thunderstorms, high winds, or low visibility
  - Procedures for the inspection and removal of sand, dust, frost, ice, snow, or standing water.
- c) Hot and Cold Weather Maintenance. PMIs should evaluate an operator's MM to ensure that it contains detailed procedures and guidance on hot and cold weather maintenance, including the following:
1. Procedures for the inspection of ramps for accumulation of sand, dust, frost, ice, snow, or standing water; and
  2. Restrictions and cautions on aircraft movements.
- d) Sandstorm Procedures. The MM must contain the following types of information concerning sandstorm protection for crew members, ground maintenance, and management personnel, aircraft and other equipment:
1. Assignment of responsibility for ensuring that company aircraft are either ferried (fly away procedures) out of the area or made secure from the effects of dust, sand and other debris.
  2. Conditions that require implementation of sandstorm procedures.
  3. Parts of the aircraft requiring emphasis, such as flight control surfaces, intakes, nacelles, pitot systems, etc.. These procedures should include the initial protection and subsequent cleaning and inspection required to ensure no hazardous quantities of sand or dust find their way into the aircraft or engines.

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4. Locations on the ramps or aerodromes where aircraft and equipment may be hangered or marshaled.
  5. Engine auxiliary power unit (APU) and ground equipment operation during storm conditions.
- e) Deicing Procedures. Aircraft ground deicing procedures should be clearly delineated by the operator. While such procedures are usually in the operator's manual, the MM must contain the following types of information concerning deicing for crew members, ground maintenance, and management personnel:
1. Assignment of responsibility for ensuring that aircraft is clear of frost, ice, and snow accumulation.
  2. Conditions that require aircraft ground deicing.
  3. Procedures to ensure the effectiveness of deicing, including the frequency of applications, proper fluid mixtures, and tactile or close visual checks of selected portions of critical surfaces.
  4. Parts of the aircraft to deice, including a description of the critical surfaces of the aircraft used by the operator.
  5. Locations on the ramps or aerodromes where deicing will be conducted.
  6. Engine auxiliary power unit (APU) and ground equipment operation during deicing;
  7. Passenger and ramp personnel protection during deicing.
  8. Procedures to be used by contract personnel when the operator contracts for deicing services;
  9. If applicable, a complete description of the elements of the operator's ground deicing/anti-icing program and the procedures required to operate under that program.

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10. If applicable, a complete description of the operator's ground deicing/anti-icing operational procedures.

f) Contract Services. PMIs must ensure that the MM/PPM, as appropriate, contains policy and guidance concerning the interrelationship between the operator's personnel and the personnel of organizations who provide contract services at line stations. Contractor personnel are required to be trained on operator-specific procedures. The appropriate manual must contain the specifications for the following: the types of training to be given to contractor personnel, who is responsible for providing the training, and who is responsible for keeping records of the training. Although the contractor may be delegated this responsibility, the operator has final responsibility.

**E. Human Factors Principles.** GACAR §§ 121.139(c)(7), 125.77(c)(2) and 135.83(g), require that each OM include human factors principles. GACAR § 133.61(1) requires that the design of the manual must incorporate human factors principles. POIs should review the manuals to ensure that those principles are included in the design of the manuals. For further information on this topic, consult the guidance material on the application of Human Factors principles that can be found in the International Civil Aviation Organization (ICAO) Human Factors Training Manual (Doc 9683).

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#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 6. Evaluate a Maintenance Manual/Revision for Part 135**

###### **4.12.6.1. GACA ACTIVITY REPORT (GAR).**

A. 3302 (AW)

**4.12.6.3. OBJECTIVE.** This section provides guidance for evaluating an operator's maintenance manual (MM) or revision to ensure that policies, procedures, and technical criteria meet regulatory requirements.

**NOTE:** This guidance should be used for the original certification of an operator.

###### **4.12.6.5. GENERAL.**

A. The manual should enable the operator's maintenance and servicing personnel to carry out their duties at a high level of safety. The complexity of the manual will vary with the complexity of the operation. The manual must cover specific items in accordance with the General Authority of Civil Aviation Regulations (GACARs), but may include additional items at the discretion of the operator. A MM is therefore accepted rather than approved (except for operators electing to implement a CAMP).

B. Manual acceptance can cause a delay in the operator's certification process. If the operator does not have experienced and qualified personnel to prepare an acceptable manual, using a consultant may be appropriate. A consultant can be used in an advisory position only. After the review, the manual must be returned to the operator with a list of any discrepancies found. The operator must be informed that final certification will not be completed until discrepancies are corrected. Inspectors should be concerned primarily with ensuring regulatory compliance.

###### **4.12.6.7. REVIEWING OPERATOR'S MAINTENANCE MANUAL .**

A. The MM is an administrative tool used to control and direct personnel. It should define all aspects of the maintenance operation.

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- 1) The policies and procedures section should address organizational matters.
- 2) The maintenance section should address policies and procedures for administering the inspection and maintenance requirements, test flight requirements, and other subjects, as applicable.

**B.** The MM should include detailed instructions or specific references for accomplishing inspection and maintenance functions. It should also include forms, instructions, and references for recurring non-routine requirements, such as engine changes and inspections following abnormal occurrences (hard landings, lightning strikes, severe turbulence, high brake energy stops, etc.).

**C.** Manufacturers' technical manuals provide instructions for accomplishing specific tasks. These documents also establish methods, technical standards, measurements, and operational test procedures. The policy and procedures section of the operator's manual must describe areas of application for the pertinent technical documents.

**D.** The following is a list of examples of MM sections and titles:

- General policy and procedures
- Inspection procedures
- Maintenance procedures
- Training
- Wiring
- Parts
- Overhaul
- Structural repair
- Manufacturers or vendors
- Mass and balance control

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- Servicing

**E.** Manuals should be easy to revise and show the date of last revision on each page. The manuals should have a page control system showing the number of pages and including the latest revision. The page control system is usually identified as a list of effective pages.

**F.** The operator is responsible for ensuring that manuals present adequate guidance to meet all regulatory requirements. The operator must understand and accept this responsibility early in the certification process.

**4.12.6.9. COORDINATION REQUIREMENTS.** This task requires close coordination between the aviation safety inspector (Inspector) and the operator.

### **4.12.6.11. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References.**

- GACAR Parts 43, 91 and 135

### **4.12.6.13. PROCEDURES.**

**A. Brief Operator.** Provide the operator with policies and regulatory requirements. Schedule and conduct a preliminary meeting, if necessary.

**B. Review Schedule of Events.** If this task is to be performed as part of an original certification, review the schedule of events to ensure that the task can be accomplished on schedule.

**C. Evaluate Manual Requirements.** The maintenance manual referred to in GACAR § 135.85(b) must contain at least the items listed under GACAR Part 135, Appendix A, II, (a) thru (j) including the NOTE regarding those Part 135 operators who wish to establish and maintain a CAMP (optional). The following list of items in subparagraph (C) thru (F) speaks to those requirements and recommends other aspects of Part 135 maintenance manual design that has been used successfully in other Part 135 programs. Inspectors should ensure that the operator/applicant's policies and procedures manual describe procedures, levels of authority, and information appropriate to GACAR Part 135.

- 1) The manual should include a description introducing its philosophy and goals. If the

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manual is in more than one volume, it should describe the division of contents between the volumes. The manual should also contain a list of effective dates.

- 2) Manual revision and distribution procedures are required to provide current information to all manual holders. The manual should include provisions to make it available to maintenance and ground personnel and to furnish a copy to the GACA.
- 3) Significant terms, acronyms, or abbreviations unique to the manual should be defined. Common industry terms do not need to be defined if the common meaning is intended. Terms clearly defined in the text do not need to be included.
- 4) The manual should detail requirements to carry the appropriate parts of the manual on the aircraft, if applicable.

### D. Ensure MM Contains Required Organizational Elements. Check for the following:

- 1) The names of all management personnel authorized to sign applicable operations specifications (OpSpecs) and act on behalf of the operator.
- 2) Organizational charts for the following:
  - Lines of authority
  - Maintenance organization and support structure
- 3) Job descriptions for all elements noted above.
- 4) Procedures for and a description of a training program that ensures the following:
  - All personnel, including inspection personnel, are fully informed of procedures and techniques currently in use
  - All personnel are competent to perform their duties
  - A method of documenting and retaining training records is established
- 5) Procedures that would ensure that an adequate number of pages be retained in the aircraft maintenance logbook (or equivalent document). This would alert the flight crews of any

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routine and non-routine maintenance performed since the last flight.

### **E. Ensure MM Contains Compliance Procedures.** Check for the following:

- 1) Procedures to ensure compliance with aircraft mass and balance limitations.
- 2) The operator's Operations Specifications (OpSpecs), or appropriate extracted information (must retain identity as OpSpecs).
- 3) Procedures, policies, instructions and controls for the use of the Minimum Equipment List (MEL) and Configuration Deviation List (CDL), if applicable.

**F. Human Factors Principles.** GACAR § 135.83(g), requires that each MM include human factors principles. Inspectors should review the manuals to ensure that those principles are included in the design of the manuals. For further information on this topic, consult the guidance material on the application of Human Factors principles that can be found in the International Civil Aviation Organization (ICAO) Human Factors Training Manual (Doc 9683).

**G. Evaluate Manual Contents.** The operator's MM must describe procedures and provide information appropriate to the applicable operating regulations. The following items having regulatory references are required to be in the manual; other items listed as recommendations will increase the utility of the manual:

- 1) *Manual Description.* The manual should include the name of each maintenance management person referenced in GACAR § 135.35 and list:
  - The person's assigned area of responsibility
  - The person's duties
  - The person's responsibilities
  - The person's authority
  - Name and title of each person authorized to exercise operational control
- 2) *Manual Revision and Distribution Procedures.* The operator's MM should describe the

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revision control procedures and how the distribution of manuals will be controlled (Ref. GACAR § 135.87).

- a) Manuals should be easy to revise and have the date of the latest revision on each page. The manuals should have a page control system that shows the number of pages and ensures that the latest revision is included. The page control system is usually identified as a list of effective pages (Ref. GACAR § 135.83 (b) (c) and (f)).
- b) Manuals should have a distribution system that meets the requirements of GACAR § 135.87, as applicable.
- 3) It is recommended that any terms (definitions) in the manual that are unique to the operator's operation be defined.
- 4) It is recommended that the duties and responsibilities of appropriate members of the ground organization personnel be defined.
- 5) Duties and responsibilities of management personnel, including the names and addresses (contact information) of those required by GACAR §§ 135.35(a)(3).
- 6) Instructions and procedures for maintenance, preventive maintenance, and servicing (GACAR Part 135, Subpart J).
- 7) Time limitations or standards for determining time limitations for overhauls, inspections, and checks of airframes, engines, propellers, appliances, and emergency equipment (GACAR Part 135, Subpart J).
- 8) Procedures for aircraft refueling, eliminating fuel contamination, fire protection (including electrostatic protection), and supervising and protecting passengers during refueling (GACAR §135.337).
- 9) Methods and procedures for maintaining the aircraft's mass and center of gravity (CG) within approved limits (GACAR § 135.85 (b)).
- 10) It is recommended that copies of OpSpecs, Parts D and E, if appropriate, be included in the manual. The operator may decide, however, to insert pertinent excerpts of its OpSpecs or reference the OpSpecs in such a manner that they retain their identity.

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- 11) Procedures for reporting and correcting mechanical irregularities, which address the following:
- a) Recording actions in the aircraft maintenance log (GACAR § 135.693).
  - b) Ensuring the aircraft maintenance log is readily accessible to each flight crew member (GACAR § 135.693 (b)).
  - c) MEL (GACAR Part 135 Appendix A II, (2)).
  - d) MEL placard system.
  - e) Deferred maintenance.
  - f) Maintenance record entry requirements in the maintenance section of the manual.
  - g) Providing a copy to the pilot-in-command (PIC).
  - h) It is recommended that a list of required maintenance related forms and the requirements for their preparation and completion be included.
  - i) Distributing required reports and forms (GACAR §§ 135.695 (Service Difficulty Reports) and 135.697 (Mechanical Interruption Summary Reports)).
  - j) Test flight requirements and limitations, including the following:
    - Items requiring test flight
    - Procedures for performing test flight
- 12) Ferry flight procedures, as appropriate.
- 13) Procedures for the following:
- a) Reporting the occurrence or detection of each failure, malfunction, or defect of mechanical reliability (mechanical reliability reports).
  - b) Reporting each interruption to a flight, unscheduled change of aircraft en route, or

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unscheduled stop or diversion from a route caused by known or suspected mechanical difficulties (GACAR § 135.697, Mechanical Interruption Summary Report).

c) Submitting required aircraft and engine utilization reports to the GACA, if required.

d) Ensuring all major alteration reports are submitted to the GACA.

e) Ensuring reports of major repairs are prepared and retained by the operator.

### 14) Other procedures, as appropriate, including the following:

- Parking aircraft in high winds
- Short-term storage
- Long-term storage
- Seasonal operation
- Removing ice and snow from aircraft
- Sand and dust storm procedures
- Towing
- Emergency procedures
- Run-up/taxi personnel authorizations
- Aircraft ground run-up
- Taxiing aircraft
- Ramp signals and procedures
- Jacking, lifting, and hoisting
- Use of landing gear down locks

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- Use of external gust locks
- Aircraft cleaning, including materials used for cleaning and flame-proofing materials after dry cleaning
- Engine change
- Propeller change
- Cylinder change
- Engine and propeller overspeed
- High oil consumption
- Oil leaks
- Engine and propeller troubleshooting
- Oxygen and nitrogen servicing and storage

**H. Analyze Results.** Upon completion of review, analyze the results and determine whether the operator's manual meets all requirements.

**I. Debrief Operator.** Discuss discrepancies and advise the operator on what areas need corrective action.

### 4.12.6.15. TASK OUTCOMES.

**A. GAR.** Complete and file the GAR.

**B. Document Task.** File all supporting paperwork in the operator's GACA office file.

### 4.12.6.17. FUTURE ACTIVITIES.

Normal surveillance.

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#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 7. Evaluate a Maintenance Manual/Revision for Part 121**

###### **4.12.7.1. GACA ACTIVITY REPORT.**

A. 3302 (AW)

**4.12.7.3. OBJECTIVE.** This section provides guidance for evaluating an operator's maintenance manual or revision to ensure that policies, procedures, and technical criteria meet regulatory requirements of General Authority of Civil Aviation Regulation (GACAR) Part 121.

###### **4.12.7.5. GENERAL.**

**A. Company Manuals.** A maintenance manual (MM) should enable the operator's maintenance and servicing personnel to carry out their duties at a high level of safety. The complexity of the manual will vary with the complexity of the operation. The manual must cover specific items in accordance with the GACARs, but may include additional items at the discretion of the applicant.

**B. Manual Approval.** As the maintenance manual forms part of the operator's continuous airworthiness maintenance program (CAMP) any delay on the part of the operator in creating a MM acceptable to the GACA can cause a delay in an operator's certification process. If the operator does not have experienced and qualified personnel to prepare an acceptable manual, the use of a consultant may be appropriate. The operator can only use a consultant in an advisory position. After the review, the aviation safety inspector (Inspector) must return the manual to the operator with a list of any discrepancies found. The Inspector must inform the operator that final certification will not be complete until the operator corrects the discrepancies. Inspectors should be concerned primarily with ensuring regulatory compliance.

**C. Best Practices.** The review, acceptance and approval processes illustrated in this Section may be used in reviewing any and all operating manuals that are utilized in any GACAR operating environment.

###### **4.12.7.7. REVIEWING OPERATOR'S MANUAL .**

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**A. The Manual as an Administrative Tool.** The manual is an administrative tool used to control and direct personnel. It should define all aspects of the maintenance operation.

- 1) The policies and procedures section should address organizational matters.
- 2) The maintenance section should address policies and procedures for administering the inspection and maintenance requirements, test flight requirements, and other subjects, as applicable.

**B. What the Manual Should Include.** The manual should include detailed instructions or specific references for accomplishing inspection and maintenance functions. It should also include forms, instructions, and references for recurring non routine requirements, such as engine changes and inspections following abnormal occurrences (hard landings, lightning strikes, severe turbulence, high brake energy stops, etc.).

**C. What Manufacturers' Technical Manuals Provide.** Manufacturers' technical manuals provide instructions for accomplishing specific tasks. These documents also establish methods, technical standards, measurements, and operational test procedures. The policy and procedures section of the operator's manual must describe areas of application for the pertinent technical documents. The following are examples of MM sections and titles:

- General policy and procedures
- Inspection procedures
- Maintenance procedures
- Training
- Wiring
- Parts
- Overhaul
- Structural repair

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- Manufacturers or vendors
- Mass and balance control
- Servicing

**D. Manual Revision Requirements.** Manuals must be easy to revise and must show the date of the last revision on each page. The manuals must have a page control system showing the number of pages and including the latest revision. The page control system is usually a list of effective pages.

**E. Operator Responsibilities.** The operator is responsible for ensuring that manuals present adequate guidance to meet all regulatory requirements. The operator must understand and accept this responsibility early in the certification process.

**F. Inspector Revision Requests.** An Inspector may, when necessary, formally request revision to any part of the maintenance manual when such revision is in the interest of safety, or when the manual does not meet regulatory requirements. An Inspector may also formally request revision to any part of the maintenance manual when such revision is in the interest of safety, or when the manual does not meet the requirements of the applicable GACAR part. The Inspector should only use this authority when:

- Safety considerations or GACAR requirements adequately substantiate the need for revisions
- When informal discussions with the operator fail to accomplish the necessary revision

**4.12.7.9. COORDINATION REQUIREMENTS.** This task requires close coordination between Airworthiness Inspectors, and, in some areas, Operations Inspectors.

### 4.12.7.11. REFERENCES, FORMS, AND JOB AIDS.

#### A. References:

- GACAR Parts 43, 91 and 121

#### B. Forms. GACA Activity Report (GAR).

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**C. Jog Aids.** None.

### **4.12.7.13. PROCEDURES.**

**A. Brief Operator.** Provide the operator with policies and regulatory requirements. Schedule and conduct a preliminary meeting, if necessary.

**B. Review Schedule of Events.** If this task is part of an original certification, review the schedule of events to ensure that the task can be accomplished according to the schedule.

**C. Evaluate Manual Requirements.** The maintenance manual referred to in GACAR § 121.143 must contain at least the items referred to in GACAR Part 121, Appendix G, II, Maintenance Manual, (a) thru (q). The following narrative in subparagraphs C thru F addresses many of those requirements and recommends other aspects of Part 121 maintenance manual design that has been used successfully in other Part 121 programs. Inspectors should ensure that the operator's policies and procedures manual describes, appropriately, procedures, levels of authority, and information appropriate to GACAR Part 121.

- 1) The manual must include a description introducing its philosophy and goals. If it is in more than one volume, the manual must describe the division of contents between the volumes. The manual must also contain a list of effective dates.
- 2) Manual revision and distribution procedures to provide current information to all manual holders are required. The manual must include provisions to make it available to maintenance and ground personnel and to furnish a copy to the GACA.
- 3) The manual must define significant terms, acronyms, or abbreviations unique to the manual. The manual does not need to define common industry terms, as long as it intends the common meaning. The manual's definitions section also does not need to include terms clearly defined in the text.
- 4) The manual must detail requirements for non-scheduled air operators to carry the appropriate parts of the manual on the aircraft, if applicable. If manuals are on microfilm, procedures to ensure that readers are aboard the aircraft are required.

**D. Ensure that the Manual Contains Required Organizational Elements.** Check for the following:

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1) The names of all management personnel authorized to sign applicable operations specifications (OpSpecs) and act on behalf of the operator.

2) Organizational charts that must include:

- Lines of authority
- Maintenance organization and support structures

3) Job descriptions for all elements noted above.

4) Procedures for, and a description of, a training program that:

- Informs all personnel, including inspection personnel, of procedures and techniques currently in use
- Ensures all personnel are competent to perform their duties
- Establishes a method of documenting and retaining training records

### **E. Ensure that the MM Contains Compliance Procedures.** Check for the following:

1) Procedures to ensure compliance with aircraft mass and balance limitations, including:

- Pre-weighing and weighing requirements
- Necessary equipment
- Standards
- Forms and documents

2) The operator's Operations Specifications (OpSpecs), or appropriate extracted information (should retain identity as OpSpecs).

3) Procedures, policies, instructions and controls for the use of the minimum equipment list (MEL) and Configuration Deviation List (CDL), if applicable.

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- 4) Procedures, standards, and limits for periodic inspection and calibration of precision tools, measuring devices, and test equipment.

**F. Human Factors Principles.** GACAR §§ 121.139(c)(7) requires each MM include human factors principles. POIs should review the manuals to ensure that those principles are included in the design of the manuals. For further information on this topic, consult the guidance material on the application of Human Factors principles that can be found in the International Civil Aviation Organization (ICAO) Human Factors Training Manual (Doc 9683).

**G. Evaluate MM Contents.** The operator's maintenance manual must describe procedures and provide information appropriate to the applicable GACAR parts.

- 1) *Manual description.* The Inspector must ensure that manual description and procedures meet the requirements of GACAR § 121.143(b).
- 2) *Manual revision and distribution procedures.* The operator's manual must describe the revision control procedures and how it will control the distribution of manuals GACAR §§ 121.139 (a)) and 121.151 (a), and (c)).
  - a) Manuals must be easy to revise and have the date of last revision on each page. The manuals must have a page control system that shows the number of pages and ensures that the manual includes the latest revision. The page control system is usually a list of effective pages (GACAR§ 121.139 (c) (3)).
  - b) Manuals must have a distribution system that meets the requirements of GACAR § 121.151.
- 3) *Definitions.* The manual should define any terms contained in the manual that are unique to the operator's operation.
- 4) The organizational chart must describe, at a minimum, the management personnel and the major functions those persons perform. Further, the GACA recommends that the chart cover the operator's entire maintenance organization in detail (GACAR § 121.45).
- 5) This list, referenced in item 4, must include persons with whom the operator has arranged to perform any of its required inspections, other maintenance, preventive maintenance, or alterations, including a general description of the work (GACAR § 121.675).

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- 6) The program must ensure the following (GACAR § 121.651).
  - a) The operator's personnel perform maintenance, preventive maintenance, and alterations in accordance with the operator's manual (GACAR § 121.679(a)).
  - b) The operator provides competent personnel, adequate facilities, and equipment for accomplishing maintenance, preventive maintenance, and alterations (GACAR § 121.679(b)).
  - c) The operator's personnel have properly maintained each aircraft released to service and ensured that it is airworthy (GACAR § 121.679 (c)).
- 7) The maintenance manual is required to include programs required by GACAR § 121.679, that personnel must follow while performing maintenance, preventive maintenance, and alterations of the operator's aircraft, including airframes, aircraft engines, propellers, rotors, appliances, and emergency equipment. These programs must include at least the following: (GACAR § 121, Appendix G, II, (c) (1) thru (10))
  - a) A method for performing routine and non routine maintenance (other than required inspections), preventive maintenance, and alterations.
  - b) A designation of items of maintenance and alteration that personnel must inspect (required inspections). The designations should include at least those items which, if personnel do not perform maintenance properly or use improper parts or materials, could result in a failure, malfunction, or defect endangering the safe operation of the aircraft.
  - c) A method of performing required inspections and the occupational title(s) of persons authorized to perform each required inspection.
  - d) Procedures for re inspecting work performed under previous required inspection findings (“buy back” procedures).
  - e) Procedures, standards, and limits necessary for required inspections and acceptance or rejection of inspected items.
  - f) Procedures, standards, and limits necessary for periodic inspection and calibration of precision tools, measuring devices, and test equipment.

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- g) Procedures to ensure that qualified maintenance personnel perform all required inspections.
- h) Instructions to prevent any person who performs work on any item from performing required inspection of that work.
- i) Instructions and procedures to prevent anyone rescinding any decision of an Inspector regarding a required inspection, other than those persons listed below:
- Supervisory personnel of the inspection unit
  - A person at a supervisory level of administrative control who has overall responsibility for the management of both the required inspection functions and the other maintenance, preventive maintenance, and alterations functions
- j) Procedures to ensure that, before releasing the aircraft to service, employees complete required inspections, maintenance, preventive maintenance, and alterations not completed as a result of employee shift changes or similar work interruptions.
- k) A description of the maintenance procedures and the procedures for completing and signing an airworthiness release.
- l) A suitable system, which may include a coded system, providing for preservation and retrieval of information in a manner acceptable to the President.
- A description of the work performed or reference to data acceptable to the President
  - The name of the person performing the work if the work is performed by a person outside the organization of the operator
  - The name or other positive identification of the individual approving the work
- m) Detailed safety procedures and guidance on servicing and maintaining aircraft during line station maintenance.
- n) Detailed procedures and guidance on hot and cold weather maintenance.

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- o) Policy and guidance on the interrelationship between the operator's personnel and the personnel of organizations who provide contract services at line stations.
- p) Details of the training to be given to contract personnel to include responsibility for who will provide the training and maintain records of training.
- q) Maintenance control procedures to include duties and responsibilities of the maintenance control supervisor and the relationship between maintenance control and dispatch (scheduled operations) and maintenance planning procedures.
- r) A description of the procedures for monitoring, assessing and reporting maintenance and operational data (for operators of large airplanes with a maximum certificated take off mass greater than 5700 kg and rotorcraft with a maximum certificated take off mass greater than 3175 kg).
- s) A description of the procedures for complying with the service information reporting requirements of GACAR § 121.1553(d).
- t) A description of procedures for assessing continuing airworthiness information from the organization responsible for the type design and implementing any resulting actions (for operators of large airplanes with a maximum certificated take off mass greater than 5700 kg and rotorcraft with a maximum certificated take off mass greater than 3175 kg).
- u) A description of the procedures for implementing action resulting from mandatory continuing airworthiness information.
- v) A description of establishing and maintaining a system of analysis and continued monitoring of the performance and efficiency of the maintenance program, in order to correct any deficiency in that program as provided in GACAR § 121.691.
- w) A description of aircraft types and models to which the manual applies.
- x) A description of procedures for ensuring that inoperative instruments or equipment affecting airworthiness are recorded and corrected as provided in GACAR §§ 121.659 and 121.699.

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- y) A description of the procedures for advising the President of significant in service occurrences as provided in GACAR § 121.1553(d).
- 8) The maintenance manual must also contain:
- a) Instructions and procedures for maintenance personnel to follow if confronted with errors or deficiencies in documented maintenance procedures (maintenance manual, work cards, etc.) especially while performing maintenance that requires immediate corrective action to ensure safe practices and airworthy aircraft. The procedures must include instructions for documenting the error and ensuring the deviation or corrections are validated and acceptable to the GACA.
  - b) Time limitations or standards for determining time limitations for overhauls, inspections, and checks of airframes, engines, propellers, appliances, and emergency equipment (GACAR § 121.667 (a) (1)).
  - c) Procedures for aircraft refueling, elimination of fuel contamination, fire protection (including electrostatic protection), and supervision and protection of passengers during refueling (GACAR § 121.1259).
  - d) Airworthiness inspections, including instructions covering procedures, standards, responsibilities, and authority of inspection personnel (GACAR § 121.667 (b) (2)).
  - e) Methods and procedures for maintaining the aircraft's mass and center of gravity within approved limits (GACAR §§ 121.197 and 121.1517 (d)).
- 9) The manual must include training programs to ensure that each person who determines the adequacy of the performance of maintenance and preventive maintenance is competent to perform the necessary duties and is fully informed about procedures, techniques, and new equipment in use (GACAR § 121.695). Applicable training programs should include a training program description, maintenance training requirements, and information about the frequency of training.
- 10) Copies of OpSpecs, Parts D and E, are normally included in the manual. The operator may decide, however, to insert pertinent excerpts of its OpSpecs or to reference the OpSpecs. If it chooses the latter, the operator must reference the OpSpecs in such a manner that the OpSpecs retain their identity as OpSpecs.
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- 11) The manual must provide procedures for the reporting and correction of mechanical irregularities. These procedures must address the following (GACAR§ 121.1541 and 121.1545):
- a) The recording of actions in the aircraft maintenance log.
  - b) The method of ensuring that the aircraft maintenance log is readily accessible to each flight crew member (GACAR § 121.1541 (b)).
  - c) The MEL (GACAR § 121.517(a)(2) and (4).
  - d) The MEL placard system.
  - e) Deferred maintenance.
  - f) Airworthiness Release procedures or maintenance record entries in the maintenance section of the manual, that include a certification that:
    - Maintenance personnel performed work in accordance with the requirements of the manual
    - Maintenance personnel inspected all items required to be inspected
    - No known condition exists that would make the airplane un-airworthy
    - So far as the work performed is concerned, the airplane is in condition for safe operation
  - g) The determination of qualifications and authorization of persons to perform airworthiness releases.
  - h) Definition of when an Airworthiness Release is required.

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- i) The form and manner in which the operator will document an Airworthiness Release.
  - j) Provision of a copy to the pilot in command.
  - k) A list of required maintenance related forms and the requirements for preparation.
  - l) Distribution of required reports and forms (GACAR §§ 121.1549, 121.1553, and 121.1557).
- 12) The manual must provide procedures to ensure that maintenance personnel use proper parts and materials, including (GACAR § 121.679):
- Receiving inspection
  - Shelf time
  - Preservation of parts
  - Parts identification system
  - Disposition of failed parts
- 13) The manual must provide the specifics of the operator's Continuing Analysis and Surveillance System (CASS), including (GACAR § 121.691):
- Audit system
  - Mechanical performance
- 14) The manual must contain maintenance flight requirements and limitations. These include:
- Items requiring maintenance flight
  - Procedures for performing maintenance flight
- 15) The manual must include ferry flight limitations and procedures.

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16) The manual must provide procedures for the following:

- Reporting the occurrence or detection of each failure, malfunction, or defect of mechanical reliability (Mechanical Reliability Reports (MRR))
- Reporting each interruption to a flight, unscheduled change of aircraft en route, or unscheduled stop or diversion from a route caused by known or suspected mechanical difficulties (Mechanical Interruption Summary Report (MISR))
- Submitting required aircraft and engine utilization reports to the GACA
- Ensuring that the operator submits all major alteration reports to the GACA
- Ensuring that the operator prepares and maintains reports of major repairs (these may be in the form of engineering orders, if the operator is so structured)

17) The manual must also contain other procedures, as appropriate, including:

- Parking aircraft in high winds
- Short term storage
- Long term storage
- Seasonal operation
- Removing ice and snow from aircraft
- Sand and dust storm procedures
- Towing
- Emergency procedures
- Run up/taxi personnel authorizations
- Aircraft ground run up

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- Taxiing aircraft
  - Ramp signals and procedures
  - Jacking, lifting, and hoisting
  - Use of landing gear down locks
  - Use of external gust locks
  - Aircraft cleaning, including materials used for cleaning and flame proofing materials after dry cleaning
  - Engine change
  - Propeller change
  - Engine and propeller overspeed
  - High oil consumption
  - Oil leaks
  - Engine and propeller troubleshooting
  - Oxygen and nitrogen servicing and storage
- 18) The manual must include additional maintenance for Category II or Category III operations, if applicable. (See Volume 5, Chapter 2)
- 19) The manual must include procedures and information, as appropriate, concerning control and handling of aircraft components or consumable materials that contain Transportation of Dangerous Goods Procedures including:
- a) Procedures and information designed to assist personnel (particularly maintenance, shipping, and stores personnel) in identifying or recognizing aircraft components or consumable materials that contain dangerous material, if personnel will be moving, storing, or handling those aircraft components or consumable materials within the air

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operators' or contract maintenance providers' facilities. The manual must also include procedures and instructions relating to the safe movement, storage, or handling of those aircraft components or consumable materials.

- b) Procedures and information for determining the proper packaging, marking, labeling, and materials compatibility, including instructions for the safe movement, storage, and handling of aircraft components or consumable materials that classified as dangerous goods while they are within the operators' facilities.
- c) Information, guidance, and precautions regarding the specific hazards associated with aircraft components or consumable materials containing dangerous material that personnel will move, store, or handle within the operators' facilities.
- d) Information, instructions, and detailed procedures for the proper disposal of unserviceable aircraft components or consumable materials containing dangerous material.
- e) In addition, Principal Inspectors (PI) should ensure that operators are aware that all of the regulations governing the transportation of dangerous goods by air contained in GACAR Part 109 apply to the operators' shipment of dangerous material to themselves (company materials) as well as the shipment of dangerous material to or for other persons.

**H. Preservation of Flight Recorder Records.** In case of accidents or incidents, GACAR Part 121, Appendix G, I, (Operations Manual) (a) (12), requires that operators have a program that includes procedures for the preservation of all related flight recorder records and, if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined under Saudi Arabian Aviation Investigation Bureau regulations. Operators may need to include maintenance related aspects of the preservation of flight recorder records in the MM.

**I. Analyze Results.** Upon completion of review, analyze the results and determine whether the operator's manual meets all requirements. Maintenance manuals that are acceptable to the GACA will be recorded on OpSpec D72. See Volume 15, Chapter 3 for further details.

**J. Debrief Operator.** Discuss discrepancies and advise what areas need corrective action.

### 4.12.7.15. TASK OUTCOMES.

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**A. Complete the GAR Record.**

**B. Document the Task.** File all supporting paperwork in the operator's office file.

**4.12.7.17. FUTURE ACTIVITIES.** Normal surveillance.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 8. Aircraft Checklists for Parts 121, 125, 133 and 135**

**4.12.8.1. GENERAL.** This section contains direction and guidance for Principal Operations Inspectors (POI) for the review of aircraft checklists for General Authority of Civil Aviation Regulation (GACAR) Part 121, 125, 133 and 135 operators. These operators must provide aircraft checklists to their flight crew members and the flight crew members must use them. The basic requirement for the use of checklists under the GACARs may be found in GACAR § 91.303(c)(21). Other references mandating the use of checklists may be found in the operating rules. For instance, the requirements mandating the use of checklists may be found in Part 121, Appendix G, I (a) (20 and (b) (2), (10), (12), et.al. Flight crew members are required to use aircraft checklists during operations. For GACAR Part 121 operators, aircraft checklists must be approved by the President, and for Part 135 operators these checklists must be acceptable to the General Authority of Civil Aviation (GACA) (see Section 1 of this Chapter for definitions of acceptance and approval).

**A. Definition.** A checklist is a formal list used to identify, schedule, compare, or verify a group of elements or actions. A checklist is used as a visual or oral aid that enables the user to overcome the limitations of short-term human memory. Although a checklist may be published in a manual, it is designed for independent use so that the user does not have to reference a manual. Checklists are used to ensure that a particular series of specified actions or procedures are accomplished in correct sequence. Aircraft checklists, in particular, are used to verify that the correct aircraft configuration has been established in specified phases of flight.

**B. Standardization.** Aircraft checklists and the operator's policies for the use of checklists are one means by which operator's structure and define flight crew member roles. Research has shown that standardized procedures and effective cockpit communications are significant factors in flight safety. POIs must review the operator's policies and procedures for checklist use as an integral part of the checklist review process. POIs shall ensure that checklists and the operator's procedures for checklist use are standardized (to the extent allowed by individual aircraft differences) for all aircraft in the operator's fleet.

**C. GACA Approval or Acceptance for Specific Operators.** POIs and operators must understand that aircraft checklists published in aircraft flight manuals (AFM) are not approved by the CAA

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at the time of type certification. When a GACAR Part 121 operator proposes to use an AFM checklist, it is the responsibility of the POI to review and approve that checklist for that operator. When a Part 135 operator proposes to use an AFM checklist, the POI must review the checklist and determine that it is acceptable for that operator's use.

### D. Adequacy of Procedures.

- 1) *Objective.* The objective of a procedure must be stated clearly unless it is so commonly understood that a statement of the objective is not necessary.
- 2) *Logical Sequence.* Procedures are to flow in a logical step-by-step sequence. The most effective procedures are usually simple and each contains only the information necessary for accomplishing that procedure. Preferably, procedures should be described in a sequential step-by-step format rather than a narrative format.
- 3) *General Considerations.*
  - a) A procedure must be an acceptable method for accomplishing an intended objective.
  - b) The individual responsible for each step of a procedure must be clearly identified.
  - c) The acceptable standards of performance for a procedure are to be stated if those standards are not commonly understood or obvious.
  - d) Since a variety of personnel with differing degrees of expertise are involved in procedures, adequate information concerning the accomplishment of a procedure must be provided for the least experienced individual. A procedure may be described very briefly and concisely when the user is capable of achieving the objective without extensive direction or detail. When the user has limited training or experience, however, a procedure must be described in enough detail for the user to correctly accomplish it. When the user has limited access to other sources of information and guidance while performing a procedure, enough detail should be provided to make the user independent of other sources of information.
  - e) When a form, checklist, or tool is necessary to accomplish a procedure, the location of that item must be indicated in the procedure.

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f) Enough time should be available under normal circumstances for the user to accomplish a procedure. If sufficient time is not available to the user for accomplishing a procedure, either the procedure itself or the user's duties must be revised.

**E. Best Practices.** The review, acceptance and approval processes illustrated in this Section may be used in reviewing any and all aircraft checklists that are utilized in any GACAR operating environment.

**4.12.8.3. CHECKLIST CONTENT.** Aircraft checklists have traditionally been divided into three categories. For the purpose of this handbook, these categories are referred to as normal, non-normal, and emergency. Operators may use other titles for these categories, such as abnormal instead of non-normal. Operators may also further divide these categories into subcategories, such as alternate and supplemental. POIs shall use the following guidance when evaluating the content of an operator's checklists.

**A. Content.** POIs shall ensure that aircraft checklists are limited to action items or verification items. The aircraft checklist should not contain elaboration or explanation. POIs must ensure that the required actions and decisions for flight crews when performing a checklist are thoroughly described in the operator's manual and training program. POIs should consider the following when evaluating aircraft checklist content:

- 1) Non-normal and emergency checklists must contain each sequential step of a procedure.
- 2) A normal checklist is typically a listing of action items to be performed and verified at a particular point in flight. Normal checklist items do not necessarily represent a procedural step and may even represent completion of an entire procedure. For example, the item "Gear-Up and Locked" could indicate that the gear handle had been raised, the gear indications checked, the gear handle had been placed in the neutral position to check the up-locks, and that the handle had then been returned to the up position. Most normal procedures do not require itemization or incorporation into a checklist. For example, the procedures for making normal takeoffs and landings are not itemized in a checklist format but described in a narrative format.

**B. Criticality of Checklist Items.** Checklist items can be ranked in criticality according to the potential effect of the crew member failing to perform the action. Critical items are those items which, if not correctly performed, have a direct, adverse effect on safety. Noncritical items are "housekeeping" items or systems management items, which for operating practices must be

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routinely accomplished during a specific phase of flight, but if omitted would have a minimal effect on safety. An item may be considered to be critical on one checklist but noncritical on another checklist. For example, a flight crew's failure to set the flaps while accomplishing the before-takeoff checklist has had extremely adverse consequences. A flight crew's failure to retract the flaps while performing the after-landing checklist, however, has had little effect on safety. The operator and POI shall analyze each phase of flight to identify critical items for that phase of flight and to ensure that all critical items are included on the checklist.

**C. Diversion of the Flight Crew's Attention.** The flight crew's attention is diverted from other tasks when performing a checklist. Checklists must be kept as short as practical to minimize "heads-down" time and diversion of the crew's attention while performing the checklist.

- 1) Each additional item that is added to a checklist increases the potential for interruption when the checklist is accomplished, diversion of the crew's attention at a critical point, and the missing of critical items. Operators and POIs must weigh the benefit of including each item on a checklist against the possible adverse effects.
- 2) Items not associated with aircraft operations (such as calls to the company) shall not be placed on the checklist.

**D. Aircraft Sophistication and Checklist Design.** The degree of technological sophistication in the design of the aircraft directly affects checklist items. In older aircraft, the flight crew must manually select and monitor most items. In technologically advanced aircraft, the same items are accomplished and monitored by automatic systems that relieve the flight crew of these tasks. Checklists for technologically advanced aircraft tend to be shorter and simpler than those for older aircraft. POIs shall ensure that the operator's aircraft checklists are based on a careful task analysis of the operational requirements of the specific aircraft.

**E. Fleet Standardization.** POIs shall ensure that operators standardize checklist items and the sequence of items to the extent allowed by individual aircraft differences across all aircraft in the fleet. Checklists for technologically sophisticated aircraft are typically shorter and simpler than those for older aircraft. The items on checklists for technologically advanced aircraft, however, are normally present on checklists for aircraft with older technology. POIs shall require operators to evaluate the feasibility of placing common checklist items on checklists with standard titles for all aircraft (such as before-start, before-takeoff, or before-landing checklists). Items should appear in a standard sequence to the degree possible. POIs should not normally approve placing an item

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on a checklist that is not required for that specific aircraft solely because the item is required in other aircraft of the fleet. POIs may make exceptions, however, when the operator provides adequate justification.

**4.12.8.5. METHODS OF CHECKLIST DESIGN.** Operators may choose from at least two accepted methods of checklist design: the “challenge-do-verify” (CDV) method and the “do-verify” (DV) method. Available evidence suggests that safety is enhanced when the operator adopts and applies a consistent checklist design policy. POIs should use the following informative guidance when reviewing the design of an operator’s aircraft checklists.

**A. “Challenge-Do-Verify.”** The CDV method consists of a crew member making a challenge before an action is initiated, taking the action, and then verifying that the action item has been accomplished. The CDV method is most effective when one crew member issues the challenge and the second crew member takes the action and responds to the first crew member, verifying that the action was taken. This method requires that the checklist be accomplished methodically, one item at a time, in an unvarying sequence. The primary advantage of the CDV method is the deliberate and systematic manner in which each action item must be accomplished. The CDV method keeps all crew members involved (in the loop), provides for concurrence from a second crew member before an action is taken, and provides positive confirmation that the action was accomplished. The disadvantages of the CDV method are that it is rigid and inflexible and that crew members cannot accomplish different tasks at the same time.

**B. “Do Verify.”** The DV method (or “clean-up” method) consists of the checklist being accomplished in a variable sequence without a preliminary challenge. After all of the action items on the checklist have been completed, the checklist is then read again while each item is verified. The DV method allows the flight crew to use flow patterns from memory to accomplish a series of actions quickly and efficiently. Each individual crew member can work independently, which helps balance the workload between crew members. The DV method has a higher inherent risk of an item on the checklist being missed than does the CDV method.

**C. Selection of Design Method.** Both the CDV and the DV methods of checklist design are currently being successfully used for normal checklists. Traditionally, operators have preferred the DV method for normal checklists and the CDV method for non-normal and emergency checklists. Operators have, however, successfully used the CDV method for all checklists. POIs may approve either method for normal checklists. In most circumstances non-normal and emergency checklists are more effective when the CDV method is used. The correct

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accomplishment of the actions and procedures incorporated in the non-normal and emergency checklist categories is critical and warrants a methodical approach. Since these checklists are seldom used, however, crew members are usually not as familiar with the procedures incorporated into these checklists as they are with the procedures in normal checklists. In addition, many non-normal and emergency checklists do not lend themselves to developing flow patterns that crew members can readily recall. The CDV method also enforces crew coordination, cross-checking, and verification, all of which aid the crew member in overcoming the adverse effects of stress. POIs should not approve or accept the DV method for non-normal or emergency procedures unless the operator can provide substantial evidence that the method is effective for this application.

**D. Mechanical or Electronic Checklists.** Mechanical or electronic devices differ in format from paper, hand-held checklists, but not in the design method or use. The actions these checklists contain and their sequencing shall be consistent with the paper version (when required) available to the flight crew. Some electronic checklists will have an ability to automatically detect the completion of an action based on switch position, system state, or both. In electronic checklists, the verification in the CDV or DV methods may be a matter of observing that the items are complete via the display method used (for example, completed items turn green). The CDV or DV methods can be applied to any type of checklist. POIs should encourage the use of such aids when operators find them effective.

**E. Verification.** POIs should keep in mind that all checklist designs are subject to human error. Crew members may omit and skip checklist items. Crew members may erroneously respond to a checklist at times believing that an item or task was accomplished when it was not. At times, crew members may see what they expect to see rather than what has actually been accomplished. Both the CDV and the DV methods are subject to such human errors. POIs must ensure that operators have developed policies for using checklists that require stringent cross-checking and verification to overcome these human limitations. These policies must be compatible with the operator's crew resource management (CRM) philosophy. POIs shall review the operator's policies as an integral part of the review process.

**4.12.8.7. POLICIES FOR MANAGING THE ACCOMPLISHMENT OF CHECKLISTS.** POIs must ensure that the appropriate sections of the operator's manuals contain the specific crew member responsibilities for monitoring, verifying, and managing the accomplishment of checklists. These responsibilities should appear either as policy statements or as specific directives. POIs should use the guidance that follows when evaluating an operator's policies for the accomplishment of

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checklists.

**A. Objective of Policy Statements and Directives.** The primary objective of the operator's policy statements or directives is to standardize crew member interaction. These statements should include, but not be limited to, the following items:

- Flight crew responsibilities for maintaining aircraft control, analyzing situations, and for requesting the appropriate checklist in non-normal and emergency situations
- The specified crew member responsible for initiating each checklist
- The specified time when each checklist is to be initiated
- The specified crew member responsible for accomplishing each item on the checklist
- The specified crew member responsible for ensuring that each checklist is completed and for reporting that completion to the crew
- Crew member responsibilities for bringing to the attention of the pilot-in-command (PIC) and the rest of the crew any observed deviation from prescribed procedures

**B. Methods for Managing Checklist Accomplishment.** The following subparagraphs each contain a discussion of recommended methods an operator may use for managing checklist accomplishment. These methods are not all-inclusive and may not meet all of the operator's needs. POIs shall not interpret these methods as the only ones that are acceptable.

- 1) For single-pilot aircraft, the GACA recommends that operators mount the before-takeoff checklist and the before-landing checklist on the instrument panel by means of a placard. When aircraft characteristics allow, the operator should develop touch-verification procedures that contain a requirement that the pilot touch each control to verify it is in the correct position.
- 2) For two-pilot aircraft in which only the PIC has ground steering control, the recommended method for accomplishing checklists is for the second-in-command (SIC) to read all checklists when the aircraft is in motion on the ground. The recommended method for those aircraft in which either pilot can steer on the ground is for the pilot not flying (PNF) to read all checklists. In all two-pilot aircraft, the PNF should read all checklists when the

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aircraft is airborne.

- 3) For three-crew member aircraft, the recommended method is for the SIC to read the flight engineer (FE) portion of the before-engine-start checklist, so that the PIC can observe and verify the configuration of the FE panel as the FE responds to each item on the checklist. Since the PNF is the crew member most subject to interruptions from radio communications, it is recommended that the FE should read all normal checklists and verify that each pilot action has been taken when the aircraft is in motion. The FE should have the explicit task of verifying that critical items have been performed by the pilots, whether or not the FE has verbal responses for those items. In those non-normal or emergency situations that involve significant activity by the FE, it is recommended that the PNF read the checklist and verify FE actions while the FE performs and responds to the items.
- 4) For all aircraft, the crew member responsible for reading the checklist should be responsible for ensuring that the checklist is completed systematically and expeditiously. This crew member should be responsible for managing interruptions, cross-checking controls and indicators to ensure that the required actions have been accomplished, and for reporting that the checklist has been completed.
- 5) The pilot-flying (PF) should not be distracted from controlling the aircraft to perform a checklist item that another crew member can accomplish. The PF should activate only those switches or controls (other than the manual or automatic flight controls, throttles, and nosewheel steering) that are not within practical reach of another crew member. Only one pilot should be “heads down” at any time.
- 6) In the prestart phase, flight guidance and navigation checklist items have proven to be critical items. A response should be required from both pilots (and FE, if applicable) when the same setting is required for more than one device (such as computers, flight instruments, and altimeters). Inertial platform alignment and computer programming should be accomplished by one crew member and independently confirmed by another crew member. Considering the requirement for navigation accuracies, as many of these checklist items as possible should be accomplished and verified before the aircraft is moved.
- 7) In the taxi and pre-takeoff phases, aircraft configuration (such as flaps, trim, and speedbrakes) and flight guidance items (such as heading, flight-director, altitude select panel settings, and airspeed bugs) have proven to be critical. All flight crew members

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should confirm these items, and at least two crew members should respond to applicable checklist items.

- 8) On approach, flight guidance checklist items have proven to be critical items. At least two crew members should confirm and respond to these items. A response should be required from each pilot when the same setting is required on two separate devices (such as computers, flight instruments, or altimeters).
- 9) All checklist items that are critical in the before-landing phase vary with the type of airplane involved. In the operation of small airplanes, the landing gear has proven to be a critical checklist item, and both pilots should confirm and respond to this item. Although the landing gear and flaps are critical items for large, transport category airplanes, the multiple warning devices and systems that are associated with these systems make the need for a response and confirmation by both pilots less critical.
- 10) All checklists, except the after-takeoff and after-landing checklists, should be accomplished by one crew member reading the checklist items and a second crew member confirming and responding to each item. POIs shall ensure that critical items on the before-takeoff and before-landing checklists are confirmed and responded to by at least two crew members.
- 11) All checklists must be designed so that the flight crew can maintain an adequate visual scan and monitor air traffic services (ATS) communications while simultaneously controlling the aircraft. The recommended method is for the operator to group the systems management checklist items after the configuration, thrust, and flight guidance items for each phase of flight. When systems management checklist items must be accomplished in a high workload environment, it is recommended that they be accomplished by a single crew member. Usually the after-takeoff and after-landing checklists items can be accomplished silently as these items have not proven to be critical. POIs should carefully evaluate the operator's overall operation and experience before approving other checklists in which a single crew member may accomplish a checklist.
- 12) Operators should direct crew members to refrain from accomplishing action items assigned to other crew members. Crew members should be directed that when they observe that another crew member is not taking or has not taken a required action they must inform the crew member, the PIC, or the whole crew, as appropriate.

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- 13) Checklists should not be depended on to initiate changes in aircraft configuration. Operators should key aircraft configuration changes to specific operational events. For example, the operator may direct the landing gear to be extended at glide-slope intercept. For any adjustment of thrust, or configuration, a command from the PF and an acknowledgement from the crew member taking the action are required.
- 14) Flight crew members frequently cannot complete a checklist when initiated either because of an interruption or because an item on the checklist has not yet been accomplished. POIs shall ensure that each operator has developed policies for the management of these situations. For short delays, the recommended policy is for the flight crew to hold the checklist until the interruption is over and the item can be completed. When the checklist item is completed, the challenge should be repeated, the proper response given, and the checklist continued. POIs shall not accept policies that allow flight crews to skip checklist items that have not been completed and then to depend on memory to accomplish the item later. When a mechanical or electronic device allows checklist items to be accomplished in a random sequence, the POI may allow policies appropriate to the system used.

**C. Checklist Interruptions.** Operators must establish procedures to ensure that the correct checklist sequence is reestablished when unusual events interrupt the normal sequence of a flight. For example, crew member actions during normal sequences of flights are interrupted when long delays are encountered on taxi-out or when crew members vacate the flight deck.

- 1) *Vacating Flightdeck with Visitors in Cockpit.* Operators must establish additional checklist management procedures for checklist interruptions that occur when any flight crew member who is assigned to a flightdeck duty station vacates the cockpit to perform other duties, leaving persons who are occupying cockpit observer seats or who visit the cockpit during such absence with unsupervised access to unmanned flightdeck duty stations. If any checklist interruption of this kind occurs each checklist item in all of the checklists prior to engine start must be re-accomplished.
- 2) *Verification of Items Accomplished.* The flight crew must verify the accomplishment of all items on checklists that have been accomplished up to the point where the current checklist was interrupted.
- a) Minimum Requirement. As each checklist item is re-accomplished, the minimum that

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is required is a verification that switches, control handles, knobs, or levers are in the positions prescribed and that the associated indicator lights and instrument readings confirm the proper positioning of the applicable switches, control handles, knobs, or levers.

b) Additional Requirements.

1. If the verification check reveals that any switch, control handle, knob, or lever is not in the position prescribed, then the full procedure, including any associated checks for the particular checklist item(s), must be re-accomplished.
2. If the indicator lights or instrument readings associated with the proper positioning of particular switches, control handles, knobs, or levers are not in agreement with the prescribed positions of these control means and re-accomplishment of the full procedure, including any associated checks for the particular checklist item(s), does not correct the disagreement, then the flight crew must log the discrepancy in the aircraft maintenance log. The operator must either correct this discrepancy before the next flight or, if permitted, defer correction in accordance with the operator's approved minimum equipment list (MEL) procedures.

**4.12.8.9. DEVELOPMENT AND SEQUENCING OF CHECKLIST ITEMS.** POIs must ensure that checklists are developed from a careful task analysis and are consistent with the procedures section of the operator's flight manual. Phase checklist items must be in an appropriate and logical sequence. When a checklist represents an abbreviated procedure, that checklist must follow the procedural sequence. POIs should use the following additional guidelines concerning individual topics of checklist design.

- A.** Operators should standardize the sequence of checklist items as much as possible across aircraft types.
- B.** When the operator has a choice as to where an item should be placed on a checklist, it should be placed at a point where the crew workload is lowest.
- C.** Operators should keep checklists as short as possible in order to minimize interruptions. When an operator is using an electronic checklist with the ability to automatically detect the completion of an action, the POI shall encourage the use of that ability to the maximum extent

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possible.

- 1) Operators should sequence checklist items to minimize interruptions of checklist accomplishment. For example, sequencing the “INS NAV MODE” as the first item on the engine-start checklist may allow the flight crew to call for and complete the before-engine-start checklist at a convenient time even though INS alignment is not complete.
- 2) Two short checklists may be preferable to a single long one. Operators may place a line or otherwise mark a checklist where the checklist can be held until a specific event occurs. This practice is acceptable because in essence, it creates two separate checklists.

**D.** Operators must include required preflight tests on checklists, but should design checklists to preclude the unnecessary testing of systems.

- 1) Warning systems with built-in test and automatic monitor circuits do not need to be checked or included on checklists unless required by the AFM.
- 2) Many test switches in the cockpit are designed for use by maintenance personnel. Operators should not require flight crew members to perform these tests as a normal procedure.
- 3) POIs may approve the operator grouping required functional checks on a specific checklist which is performed before the first flight of the day (or at some other logical interval) and not repeated on subsequent flights.

**E.** Operators must clearly identify decision points and indicate the correct alternative action or alternative sequence of actions to be taken after each decision point. If the effect of adverse weather requires an alternate action, the operator should design the checklist to account for that alternate action. For example, if the autothrottles are normally engaged for takeoff except when engine anti-ice is being used, the checklist should contain a requirement that the autothrottles cannot be engaged with the engine anti-ice on.

**4.12.8.11. IMMEDIATE ACTION ITEMS.** Immediate action items are those items accomplished from memory by crew members in emergency situations before the checklist is called for and read.

**A.** A flight crew’s failure to correctly accomplish all immediate action items can result in a threat to continued safe flight. For example, should a flight crew fail to close the tank valve during an

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engine fire procedure, leaking fuel in the engine pylon may be ignited. In such cases, the first items on the corresponding checklist must be verification that each immediate action item has been accomplished.

**B.** In some cases, an immediate action procedure may not be incorporated in a checklist. For example, there is no point in verifying that each item of an aborted takeoff procedure has been accomplished after the aircraft has been brought to a stop. In most cases, however, there should be “follow-on” or “clean-up” checklists to be accomplished after the situation has been brought under control.

**C.** Another example of an immediate action memory item is the following statement: “All flight crew members shall immediately don O2 masks and report to the captain on interphone in the event of loss of cabin pressure.” In this example, the loss-of-cabin-pressure checklist would contain the immediate action memory item and subsequent follow on items to verify that each item has been accomplished.

**4.12.8.13. CHECKLIST TERMINOLOGY.** POIs should ensure that the operator’s aircraft checklists contain terminology that is tightly controlled to ensure clarity and common understanding. The following recommendations should be considered by POIs when reviewing checklists.

**A.** The challenges and responses on the checklist should be consistent with the labeling on the switches and controls in the cockpit.

**B.** Terms such as “tested,” “checked,” and “set” are acceptable terms only when they are clearly defined and consistently used.

**C.** Operators should have a consistent policy concerning responses to items with variable settings. “As required” may be printed on the checklist, but should not be an authorized response. A response that gives the actual setting is normally appropriate. Items that require variable responses should be carefully evaluated. Such items may not actually be required on the checklist or may be more appropriately included in the system management portion of a checklist.

**D.** Responses to checklist items concerning liquid or gas quantities should be made in terms of the actual quantities on board compared to the specific quantity required, for example: “10,000 pounds/kilograms required, 10,400 on board.” When specific quantities are required, a response of “checked” is not acceptable. A response of “checked” is acceptable when a range of quantity

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is permitted and the range is marked on an indicator, such as a green arc on an oil quantity gauge.

**E.** Excess verbiage on checklists should be discouraged. For example, a checklist item of “Reduce airspeed to 130 KIAS for best glide” can be abbreviated as “BEST GLIDE - 130 KIAS.”

**F.** Ambiguous verbiage on checklists is not acceptable. For example, “takeoff power” can mean either to advance the power or to retard the power.

**4.12.8.15. AIRCRAFT DIFFERENCES.** POIs shall ensure that operators account in the aircraft checklists for differences in various series of aircraft or in installed equipment. When there are only a few minor differences, this may be accomplished by using symbols to designate those checklist items that apply to only one series of airplanes or that apply only when the equipment is installed. When there are a significant number of differences, operators should prepare separate checklists for each series of aircraft. Policies and procedures should be established to account for differences in checklist responses when operations are conducted with equipment removed or inoperative, in accordance with MELs and configuration deviation lists (CDL).

**4.12.8.17. SEQUENCING NORMAL CHECKLISTS AND OTHER CHECKLISTS.** Normal checklist items may be incorporated in non-normal or emergency checklists to simplify cockpit management. An acceptable alternative method is to require both the normal and non-normal or emergency checklists to be accomplished in a specified sequence. This method has the advantage of allowing the normal checklist to be requested and accomplished at the time that it would normally be accomplished. Checklists should be designed so that two checklists are not in progress simultaneously. The method may depend on the degree of sophistication of the aircraft involved. In technologically advanced aircraft with short, simple checklists, it is usually preferable to keep the normal and the non-normal checklists separate. Some non-normal checklist actions may be deferred until initiation of the appropriate normal checklist. In aircraft with electronic checklists, checklists may be combined based on the priority of any one action, and/or the deferred non-normal checklist items may be automatically inserted in the appropriate normal checklist. In older airplanes, however, it may be necessary to add the normal checklist items to the non-normal or emergency checklist simply to keep the checklist manageable.

**4.12.8.19. CHECKLIST FORMAT.** POIs shall ensure that operators present checklists to flight crews in a practical and usable format. POIs should use the following guidance when evaluating aircraft checklists for proper format.

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- A.** Paper checklists should be protected either by plastic lamination or by being printed on heavy, folded pasteboard stock.
- B.** Non-normal, alternate, and emergency checklists must be in a format that allows crew members to quickly and accurately find the correct procedure while the crew member is under stress. To expedite the referencing of these checklists, a tabbed manual or other quick reference format is recommended. When a paper checklist is required on the airplane, the methods used in an electronic checklist and the associated paper checklist for referencing a particular checklist shall be sufficiently similar to minimize flight crew confusion or inappropriate flight crew response. The methods for accessing electronic checklists may determine the format used to reference checklists in the paper version.
- C.** For single-pilot aircraft, the before-takeoff checklist and before-landing checklist can be appropriately presented as placards on the instrument panel.
- D.** The type size and contrast used on a checklist is a compromise. A large type size is preferred for legibility. A small type size is preferred to keep the number of checklist pages to a minimum, which then further ease the locating of a specific checklist. The legibility of printed material depends on the size of the letters, the spacing between letters, and the type of font used. The following is offered as a suggestion to POIs for what to consider in evaluating the legibility of checklists. This guidance must not be interpreted as being the only acceptable print size and contrast that can be used for checklists:
- Checklist headings or titles—12 point type, all caps, boldface, and a plain (sans serif) font
  - Checklist text (challenge and response) and notes—10 point type, boldface, and a plain (sans serif) font
  - Contrast for headings or titles—either black print on white or reversed for emphasis
  - Contrast for text—black print on white
  - Colored borders for ease of identification—green for normal checklists, yellow for non-normal checklists, and red for emergency checklists

**NOTE:** On aircraft with electronic checklists, these selections should be consistent with the display and symbology standards used by that system.

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#### **CHAPTER 12. MANUALS, PROCEDURES AND CHECKLISTS**

##### **Section 9. Evaluate Cabin Crew Member Manuals and Checklists**

###### **4.12.9.1. GENERAL.**

**A. Overview.** This section contains direction and guidance for Principal Operations Inspectors (POI) when approving or accepting an operator's cabin crew member manuals and checklists. This process is based on the general process for approval or acceptance described in Volume 1, Chapter 4, Section 1, The General Process for Approval or Acceptance. A Cabin Crew Member Manual (CCMM) is part of an operator's Operations Manual (OM), however most operators chose to manage cabin crew member manuals separately as provided for under General Authority of Civil Aviation Authority Regulations (GACAR) Parts 121 and 125.

**B. Evaluation of Manuals for the General Authority of Civil Aviation (GACA) Acceptance or Approval.** An operator may develop and publish in its manual any policy, method, procedure, or checklist that the operator finds necessary for the type of operations conducted. These policies, methods, procedures, and checklists, however, must comply with the GACAR and be consistent with safe operating practices. POIs should encourage operators to be innovative and progressive in developing such policies, methods, procedures, and checklists. The POI's role in the review process is to provide an independent and objective evaluation of the operator's manual material. The POI must ensure that the operator's material complies with the GACARs, is consistent with safe operating practices, and is based on sound rationale or demonstrated effectiveness.

1) POIs should use the job aid in Figure 4.12.9.1, Preparation of Cabin Crew Member Manual (CCMM), to assist them in the acceptance of manuals required for cabin crew members (CCMMs) engaged in operations conducted under GACAR Part 121. This job aid may also be used to aid in the review of CCMM associated with a GACAR Part 125 operator. The job aid should be used as follows:

- a) Make a copy.
- b) Add recommendations.

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- c) Give the copy to the appropriate representative of the operator, and ask that person to document the pertinent page number for each item.
  - d) When satisfactory, initial each item.
  - e) Make appropriate remarks.
  - f) When the entire manual is satisfactory, sign the bottom of the last page of the job aid.
- 2) POIs should ensure that the information and procedures contained in the Cabin Crew Member Manual (CCMM) are consistent with the information and procedures throughout all of the operator's manuals. A review may be accomplished by comparing information and procedures (such as the operator's carry-on baggage program, exit seating program, and emergency procedures) in the CCM manual with those contained in the operator's aircraft/operations and passenger service manuals.
- 3) POIs should use a List of Effective Pages or some other method to determine currency and completion of the CCM manual.
- 4) POIs should coordinate with the operator's assigned principal security Inspector to review the security and dangerous goods procedures that are described in the operator's manuals.

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**Figure 4.12.9.1. Preparation of Cabin Crew Member Manual**

Each cabin crew member (CCM) manual should include the necessary instructions and information for all personnel to perform their duties and responsibilities with a high degree of safety. Thus, the manual should include at least the following information:

Note: This job aid has been designed primarily for operations conducted under GACAR Part 121. Portions of this job aid may also be used for evaluating manuals required under GACAR Part 125.

	Manual Page	Accepted Initials
<b>DUTIES OF CABIN CREW MEMBERS (CCMs)</b>  Definition of flight crew member, cabin crew member and crew member. This should include a general statement of the operator's philosophy regarding CCM duties and responsibilities.		
<b>MANUALS</b>  The manual must be easy to read.		
The manual must be easy to revise. The manual should contain instructions for processing revisions.		
Each manual page must have the date of the last revision.		
Each cabin crew member shall have a manual accessible while performing assigned duties. The manual should contain the stipulation that each cabin crew member must have a manual readily accessible on board any flight if they are assigned any duties.		
The manual must be up to date. This should be stated in the manual.		
<b>CREW PROCEDURES</b>  Authority of the pilot-in-command.		
Method of designating succession of command.		
When applicable, equipment interchange should be in the manual.		

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Remarks:

**ADMISSION TO THE FLIGHTDECK**

Persons who may be admitted to flightdeck are the following:

Aviation Safety Inspectors,

Government agents.

**COCKPIT SECURITY PROCEDURE**

Procedure for cockpit crew to identify cabin crew before allowing entry to flightdeck.

Locking of the cockpit door.

**STERILE COCKPIT PROCEDURE**

Include a method of having CCM's aware that the flight is in the sterile cockpit time.

**COMMUNICATION WITH CREW**

Normal methods of communication and coordination among crew members including procedures for establishing communication with the flight crew member before or immediately after flight begins.

**CREW COORDINATION**

General statement concerning the importance of crew coordination.

Preflight crew briefings – flight crew and cabin crew members.

The importance of, and procedures for, reporting in-flight irregularities and/or malfunctions (mechanical, passenger, or other) to the cockpit must be in the manual.

Crew coordination procedures to ensure that carry-on baggage has been properly stowed before the passenger loading door is closed.

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Crew coordination procedures to ensure that the aircraft (including the cabin) is ready for movement on the surface for takeoff or landing.		
Crew coordination procedures for exit seating.		
Remarks:		
Cabin Crew members (CCMs)		
Requirement for all CCMs to be seated during movement on the surface unless performing safety-related duties.		
Number of CCMs that must be on board when there are passengers on board the aircraft and it is parked at the gate. Method to identify CCM substitutes that might be used while the aircraft is parked at the gate.		
The specific number and location of CCMs that must be on board before movement on the surface. Since this information should be given for each aircraft, it could be contained in the aircraft specific part of the manual.		
CCM duties and number of CCMs required during refueling procedures.		
Policy for use of jump seat by anyone other than the assigned CCM.		
Policy of checking emergency equipment. When CCMs are required to check, then specific responsibilities for specific equipment by aircraft type may be in the appropriate section of the manual.		
<b>PASSENGER INFORMATION</b>		
Briefing passengers before takeoff about the following: Compliance with lighted signs, posted placards, and instruction of crew. Use of safety belts. Demonstration of fastening and opening seat buckles.		
That the GACA requires passenger compliance with lighted passenger information signs and crew member instructions concerning the use of safety belts.		
Smoking. Compliance with lighted signs, posted placards, and instruction of crew. That there is a prohibition against smoking in the lavatories and that Saudi law prohibits tampering with, disabling, or destroying smoke detectors.		
Location of exits.		

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Location and use of required flotation equipment.		
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Remarks:

Exit seating reference to passenger information cards.		
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A request that a passenger identify him or herself if he or she:		
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Cannot meet selection criteria,		
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Has a non-discriminable condition,		
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May suffer bodily harm,		
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Does not wish to perform those functions.		
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Individual briefing of those who may need assistance and briefing of persons who may be attending these individuals.		
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After takeoff briefing: Briefing that notifies passengers to keep their seat belts fastened even when “seat belt” sign is off (to be given after takeoff and before or immediately after “seat belt” sign has been turned off).		
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**EXTENDED OVERWATER BRIEFING**

Include everything in GACAR § 121.1253.		
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Demonstrate donning and inflating life preserver.		
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Brief on the location and operation of the following:		
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Adult life preservers,		
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Infant and child life preservers,		
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Life-rafts,		
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Other flotation means.		
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**USE OF OXYGEN**

Before flight is conducted above flight level 250, crew members shall explain the necessity of using oxygen and perform the following:	
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Point out location of oxygen dispensing equipment.		
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Demonstrate use of oxygen dispensing equipment.		
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<b>ILLUMINATED SAFETY SIGNS</b>		
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When a passenger safety information sign remains illuminated for a period of time, the crew should make periodic announcements.		
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When a passenger continues not to obey a safety information sign, the pilot-in-command should be notified.		
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Remarks:		
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<b>PASSENGERS</b>		
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Disabled:		
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Exit seating applicable parts of the GACAR. This may include the location, operation, and procedures for use of the following: onboard wheelchair,		
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Disabled equipped lavatories,		
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Movable armrests.		
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Infants and Children: The manual should include the following concerning infants and children: Procedures for restraint including location and actions during emergency.		
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Information about the types of child restraint devices that conform to all applicable standards in Appendix C of GACAR Part 91.		
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Information that if the parents have purchased a ticket and the device is approved, it must be allowed.		
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The fact that infants should be restrained in the child restraint device during turbulence.		
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<b>PASSENGER ISSUES</b>		
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Reporting persons who cause a disturbance,		
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Armed passengers,		
Passengers who abuse a crew member,		
Interference with a crew member in the performance of duties,		
Passengers who are mentally retarded,		
Passengers who are emotionally disturbed,		
Pregnant passengers,		
Exit seating requirements, i.e., Company Policy (See GACAR §121.1245(b) and (e))		
Stretcher patients,		
Policy and procedures for noncompliance of smoking ban,		
Others.		
<b>SAFETY PROCEDURES</b>		
Restraint of galley equipment (including galley and ticket carts) for movement on the surface, takeoff, landing, and when not in use. This should include the fact that carts should be on a mushroom or otherwise properly restrained when not in use.		
Proper stowage of cargo (including musical instruments and pet carriers) in the cabin.		
Remarks:		
Appropriate portions of carry-on baggage program.		
Management of boarding carry-on baggage. Each piece of carry-on baggage is properly stowed before the passenger loading door is closed. This includes closing the overhead bin and cabin cargo compartment doors.		
Approved stowage areas for carry-on baggage.		
Crew baggage stowage.		
Stowage of canes.		

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Prohibition against stowage of trash or carry-on baggage in unauthorized receptacles such as lavatories or the cockpit.		
Prohibition against commingling articles with safety equipment.		
Need for tray tables to be stowed for movement on the surface, takeoff, and landing. Movie screens that extend into the aisle must also be stowed for movement on the surface, takeoff, and landing.		
Need for seatbacks to be in their full upright position before takeoff and landing.		
Need to stow CCMs restraint systems when not in use.		
<b>DOORS</b>		
Readying doors for movement on the surface, including general statement of responsibility for readying doors. Procedures for specific crew members at specific doors would probably be better included in aircraft section of the manual.		
<b>PRESCRIPTION DRUGS</b>		
Carriage of prescription drugs.		
Use of prescription drugs.		
Remarks:		
<b>ELECTRONIC DEVICES</b>		
Procedures to follow when occupants use electronic devices and which devices are not allowed.		
Dangerous Goods (Hazardous Materials)		
Identification of and, if they are going to be in the cabin, procedures for storage and handling.		
<b>LIGHTS</b>		
Flashlight holders and how used, if used.		
Operator's policy to ensure that each crew member has a workable flashlight.		

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Cabin light setting for takeoff, landing, and forewarned (anticipated emergency evacuation and ditching).		
Specific aircraft light controls may be contained in the aircraft section of the manual.		
<b>TURBULENCE</b>		
Crew coordination in turbulence.		
Service procedures, especially of hot liquids, in turbulence.		
Passenger safety belt discipline in turbulence.		
<b>SURVIVAL</b>		
Information about survival in situations appropriate for operations such as water, mountains, desert, or jungle.		
Remarks:		
<b>HIJACKING</b>		
Hijacking procedures should be developed with the assistance of the GACA Security Inspector assigned to the operator, but the responsibility for the final acceptance of manual contents rests with the Principal Operations Inspector.		
<b>NOTE:</b> Procedures contained in cabin crew member manual may be very limited. These procedures may be a "coded" memory aid.		
A method of communication with other crew members when hijacking is either threatened.		
<b>WEAPONS</b>		
Security regulations and operator's procedures for the carriage of weapons.		
<b>ILLNESS/INJURY</b>		
Contents and procedures for use of emergency medical equipment including medical kits, universal precaution kits, first aid kits and automated external defibrillators.		

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Contents and procedures for use of the emergency medical equipment (GACAR Part 91, Appendix B). Recognition of common medical problems.		
First aid treatment that considers limited and special space for those problems in aircraft cabins.		
Use of first aid oxygen may be placed with procedures or with use of equipment. In this check list, it is with oxygen equipment. The use of portable oxygen concentrator units should also be addressed if applicable (GACAR § 91.225).		
Additional first aid.		
Remarks:		
<b>OXYGEN: USE AND NEED</b>		
Depressurization.		
Slow leaks,		
Rapid depressurization procedures, including the following:		
Signs of a loss of cabin pressure.		
Symptoms of hypoxia.		
Crew coordination,		
Cabin crew member actions, including the following:		
Grabbing the nearest oxygen mask,		
Sitting down or holding on to something solid and waiting for word from the flightdeck before moving around,		
Assisting passengers.		
Description of use of each type of portable oxygen bottle and mask. This is especially important with solid slate (chemical) oxygen generators.		
Procedures for CCM to administer oxygen to self. Procedures for use of medical (passenger supplied) oxygen (must be under operator's maintenance program).		

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Prohibition against smoking when oxygen is being administered.		
<b>FIRE PREVENTION AND CONTROL</b>		
Fire prevention procedures that at least include the following: Checking the lavatories before takeoff and periodically during flight.		
Use of smoking materials.		
Periodic cabin checks.		
Use of circuit breakers located in the cabin (precautions against resetting).		
Remarks:		
Proper storage of articles that could contribute to fire (such as matches).		
Checking of oven and oven vents.		
CCM procedures for handling passengers.		
Fire control procedures should include fires occurring in the following locations:		
On the ground,		
Outside the aircraft,		
Inside the aircraft,		
During flight.		
During fires inside the aircraft, fire control procedures should include the following:		
Type of fire extinguisher on class of fire.		
Use of protective breathing equipment (PBE).		
Fire control when volatile fuel is involved (this may be included in hijacking or threatening passenger part of the manual),		
Smoke control procedures,		

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Use of circuit breakers,		
Fire in galley, including oven,		
Fire in lavatory or other confined spaces,		
Light ballast fires.		
Remarks:		

<b>EVACUATION PROCEDURES</b>		
For each type of aircraft evacuation or ditching, the manual should at least include procedures and techniques regarding the following:		
Crew coordination,		
Giving commands to passengers,		
Describing brace for impact positions,		
Assessing conditions,		
Ensuring aircraft has come to a complete stop,		
Evacuating persons and any of their attendants who may need assistance,		
Redirecting passenger flow,		
Caring for passengers following accident.		
Un-forewarned (unanticipated aircraft evacuation or water landing) including the following:		
Crew coordination,		
Commands given to passengers,		
Initiation,		
Actions at door.		

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Forewarned (anticipated aircraft evacuation or ditching) including the following:		
Crew coordination,		
Commands given to passengers,		
Passenger preparation,		
Cabin preparation.		
Unwarranted (unneeded) evacuation, passenger or crew initiated, including the following:		
Crew coordination,		
Stopping the evacuation.		

Airline: \_\_\_\_\_  
 Principal Operations Inspector: \_\_\_\_\_

(Signature)

Date: \_\_\_\_\_

**NOTE:** This part of the form should be filled out and signed for each aircraft type/model.

**AIRCRAFT TYPE/MODEL:** \_\_\_\_\_

	Manual Page	Accepted Initials
<b>AIRCRAFT DESCRIPTION</b>  The manual should contain a description and/or diagram of each type/model of aircraft showing the items listed below. If the location of any of these items varies from one aircraft to another, registration marks and/or tail numbers with specific location should be given.		

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The assigned takeoff and landing location for each cabin crew member who may be assigned safety duties in the cabin should be clearly designated.		
The duties and duty station for each crew member (including flight crew members) during an evacuation or ditching should be given.		
If it is part of the operator's procedures, the preflight check of specific safety equipment should be given. This should include checking of placards.		
CCM location for performing safety demonstration.		
<b>AIRCRAFT EMERGENCY EQUIPMENT</b>		
The emergency equipment location should be given for each type of aircraft; however, when equipment such as the first aid kit is the same from aircraft to aircraft, the description of the contents and the operation may be contained in the "general section" of the manual each exit (clearly show what type of exit).		
Each first aid kit, each universal precaution kits		
Each medical kit, each automated external defibrillator		
Portable lights/flashlights,		
Each fire extinguisher by type,		
Each PBE,		
Flotation equipment,		
Overwater equipment,		
Survival kits and transmitters, if not attached to life raft,		
Crash ax,		
Megaphone,		
Appropriate circuit breakers,		
Portable oxygen,		
Supplemental (ship's) oxygen,		

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Approved crew bag stowage areas.

Remarks:

Each type of equipment should be depicted so its operation is easy to follow.  
This includes the following:

### **FLOOR LEVEL EXITS**

A description for operations and procedures at floor level exits should include the following:

Opening in normal mode,

Opening in emergency mode,

Ready for movement on the surface,

Ready for gate arrival,

Ready at gate, if appropriate.

### **EVACUATION SLIDES**

Description of operation and procedures for evacuation slides, slides/raft, or ramps should include the following:

Emergency inflation,

Manual inflation.

### **WINDOW EXITS**

A description of operation and procedures at window exits should include the following:

Opening exits,

Placement of window,

Recommended method of exiting window,

Use of life lines.

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**VENTRAL STAIRS**

A description and procedures pertinent to ventral stairs should include the following:

Information regarding lowering or otherwise operating stairs in normal and emergency modes;

Information about stair use in evacuations.

**COCKPIT EMERGENCY EXITS**

Information about this equipment should describe or depict the opening and the use of any equipment that would assist in reaching the ground (such as escape ropes).

Remarks:

**ESCAPE ROUTES OTHER THAN CABIN**

Information should show the method of reaching these exits, the opening, and actions necessary to exit.

**OTHER EXITS****DOOR SAFETY STRAPS**

Include both location and use in normal and emergency operations.

**DOOR INOPERATIVE PROCEDURES**

If this type of aircraft is allowed to operate with a door inoperative, the procedures to follow for the specific aircraft should be given.

**CABIN CREW MEMBER (CCM) STATION**

The CCM manual should contain a description of each type of CCM station. This description should include the following:

The proper brace position for that station;

Information about the restraint system at that station and its use;

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The safety equipment that an CCM can reach while seated at that station.		
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**ELECTRICAL EQUIPMENT**

The manual should contain information about circuit breakers, heat, or ventilation located in the cabin. This information should include the following:

Location,

Function,

Operation of the controls.

**EMERGENCY LIGHTS**

Location of emergency lights, emergency light switches, and procedures for use should be in the manual.

Information about floor proximity lighting should be given as appropriate to that type of aircraft.

Remarks:

**PUBLIC ADDRESS AND INTERPHONE SYSTEMS**

A description of these systems that includes their use in normal and emergency situations should be included.

**EVACUATION ALARMS**

When evacuation alarms are present, information about their location, function, and operation should be given.

**OXYGEN SYSTEMS**

The manual should include the following information:

Location of oxygen dispensing units,

Information about additional drop-down masks,

Proper method of use,

Manual deployment,

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If applicable, information about special characteristics of chemically generated devices, (such as heat generating properties).		
<b>PORTABLE OXYGEN EQUIPMENT</b>  Description, location, and operation for each kind of portable oxygen dispensing unit and the masks should be given.		
<b>GALLEY RESTRAINT</b>  Description of the locations and methods of securing each piece of galley equipment should be given.		
<b>CARRY-ON BAGGAGE RESTRAINT</b>  Description of the location and operation of carry-on baggage restraints should be given when applicable. This would include use of restraint straps across a closet or securing an overhead bin.		
Stowage of items other than approved cargo compartments. Some airlines have as part of their carry-on procedures the fact that carry-on baggage may be slowed in a seat. If this is the case, the seats where it can be stowed and method of stowage should be included in the manual.		
Remarks:		
<b>SMOKE ALARMS</b>  The manual should give the location of the smoke alarms. It should also contain information regarding the procedures to follow when a smoke alarm has been activated.		
<b>TRASH CONTAINER DOORS</b>  The manual should contain information about the location, function, and proper operation of these doors.		
<b>UPPER/LOWER DECK</b>  Some aircraft are multi-decked. When this is the case, information regarding safety equipment on those decks should be provided.		

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<b>LIFTS (If Applicable)</b>  Multi-decked aircraft are usually equipped with personnel/galley lifts. Operation and function of the safety interlock system of these lifts should be described.		
<b>FLOTATION CUSHIONS</b>  Location, function, and use of flotation cushions should be given.		
<b>LIFE PRESERVERS</b>  Donning, inflation, use, and activation of light for each type of life preserver, including infant and child preservers, should be given. (If only one type is used, this information may have been given in the "general section" of the manual.)		
<b>LIFERAFTS AND SLIDES USED IN FLOTATION</b>  When the aircraft is equipped with life rafts, slide/raft packs, or slides used as flotation ramps, information about this equipment should include a description of the equipment, its contents, and at least the following:  Transfer from one door to the next,  Inflation and launching,  Proper method of boarding passengers and crew.  Crew assignments during ditching and in the life raft.		
Remarks:		
<b>INOPERABLE EQUIPMENT</b>  Procedures to follow when a piece of required safety equipment is inoperable should be part of the manual.		
<b>FIRE EXTINGUISHERS/PBE</b>  The location of the equipment and any features that make use of operation unique to this aircraft.		

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**SMOKE BARRIERS**

Some aircraft are equipped with smoke barriers. When this is the case, information about their location and use should be part of the manual.

**EMERGENCY MEDICAL EQUIPMENT**

The location of the equipment and any features that make use unique to this aircraft should be given.

Remarks:

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Airline: \_\_\_\_\_

Principal Operations Inspector: \_\_\_\_\_

(Signature)

Date: \_\_\_\_\_

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 13. MASS AND BALANCE FOR PARTS 121, 125 AND 135**

##### **Section 1. Evaluate An Operator's Mass and Balance Control for Parts 121, 125 and 135**

###### **4.13.1.1. GACA ACTIVITY REPORT (GAR).**

- A. 1302 (OP) (Initial)
- B. 1303 (OP) (Revision)
- C. 3328 (AW) (Initial)
- D. 3329 (AW) (Revision)

**4.13.1.3. OBJECTIVE.** This section provides guidance for evaluating a General Authority of Civil Aviation Regulation (GACAR) Part 121, 125 or 135 operator's mass and balance control programs, procedures and systems.

**NOTE:** For the purpose of this section, the use of the word "operator" will also be used for an initial applicant.

**NOTE:** The guidance found in Volume 1, Chapter 4, Section 1, General Information and the Approval or Acceptance Process, should be followed when evaluating an operators mass and balance control program.

###### **4.13.1.5. GENERAL.**

**A.** The operator may develop and submit for approval any method or procedure by which they can show that an aircraft:

- Is properly loaded according to approved configuration (loading schedules or charts)
- Will not exceed authorized mass and balance limitations during all ground and flight operations

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- Will be periodically reweighed and its data reevaluated (addressed in Section 2 of this Chapter)
- Will have its data recalculated, if needed due to changes (addressed in Section 2 of this Chapter)

**B.** Federal Aviation Administration (FAA), Advisory Circular (AC) 120-27 (as amended), Aircraft Weight and Balance Control, should be used as guidance material for this section. The intent of FAA AC 120-27 (as amended) is to provide methods and procedures for developing mass and balance control systems.

**4.13.1.7. ACTUAL VS. AVERAGE MASS.** To comply with the GACARs, operators must elect to utilize either:

**A. Actual Mass.** The actual mass for crew, passengers, baggage, cargo etc.

**B. Average Mass.** The average mass for crew, passengers and baggage, under an approved Mass and Balance Control Program. The Mass and Balance Control Program should include all the instructions and procedures for effective mass and balance control using average masses and should undergo periodic reviews to ensure compliance.

**C.** An operator is free to elect to utilize one system for part of their fleet and the other system for the rest of their fleet.

**NOTE:** Operations Specification (OpSpec) E94 is used to authorize the type of method used for each type of aircraft in the operator's fleet.

### **4.13.1.9. MASS AND BALANCE CONTROL DOCUMENTATION.**

**A.** The operator can submit any method or procedure by which it can show that all aircraft are properly loaded and will not exceed authorized mass and balance limitations during all operations.

1) These procedures can be provided in the operator's Operations Manual (OM) and/or Maintenance Manual (MM) or they may be an independently controlled document that includes all instructions and procedures for maintenance, operations, and cargo handling.

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- 2) The mass and balance documentation must include company procedures and instructions for completing forms used in aircraft mass control and aircraft loading. Mathematical justification for loading provisions or schedules should be included in the submitted information.
- 3) For programs using average masses and loading schedules the mass and balance documentation must indicate the source of the data used to develop the program. This data may come from the manufacturer's mass and balance documentation referenced from the Type Certificate Data Sheet (TCDS), the Aircraft Flight Manual (AFM), Supplemental Type Certificate (STC) information, or other General Authority of Civil Aviation (GACA)-approved source.
- 4) The document should contain the duties, responsibilities, and authority for flight, ground operations, maintenance, and management personnel.

**B. Unusual or Complex Programs.** If the operator proposes an unusual or complex Mass and Balance Control Program, or if that program is substantially different from the other operator's mass and balance programs or the approved AFM, the aviation safety inspector (Inspector) should consult their supervisor before proceeding with the program evaluation.

**C. Load Schedules.** The loading schedules and associated loading envelopes must include a manageable system for aircraft loading under all loading situations. The operator's procedures must provide all necessary information (charts, graphs, tables, etc.) with related instructions for the loading.

**D. Major Alterations.** Occasionally, an operator may request approval to operate an aircraft with an increase in gross mass and/or change in center of gravity (CG) range. This constitutes a major design change, and requires approval by the General Authority of Civil Aviation (GACA) per GACAR Part 21.

**E. Determining the Loaded Mass and CG.** An important part of preflight planning is to determine that the aircraft is loaded so that its mass and CG location are within the allowable limits. There are two ways of doing this: by the computational method using mass, arms, and moments; and by the loading graph method, using mass and moment indexes.

### 4.13.1.11. LOADING SCHEDULE AND PROVISIONS.

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**A. Loading Schedule.** Loading schedules should be simple and orderly and based on sound principles, thus reducing the elements of human error. Loading schedules may be applied to individual aircraft or to a complete fleet. When an operator uses several types or models of aircraft, a loading schedule, which may be index-type, tabular-type, or a computer, should be identified in OpSpec E94, with the Make/Model/Series of aircraft for which it is designed.

**NOTE:** Operators wanting to utilize an Onboard Mass and Balance System must be specifically authorized to use these systems. OpSpec E94 must be utilized to authorize the use of these systems. Consult FAA Advisory Circular 120-27 (as amended) for further details concerning Onboard Mass and Balance Systems.

**B. Loading Provisions.** All seats, compartments, and other loading stations should be properly marked, and the identification used should correspond with the instructions established for computing the mass and balance of the aircraft. When the loading procedures provide for blocking off seats or compartments to remain within the CG limits, the operator should provide effective means to ensure that such seats or compartments are not occupied during the operations specified. In such cases, instructions should be prepared for crewmembers, load agents, cargo handlers, and other personnel concerned, giving complete information regarding distribution of passengers, cargo, fuel, and other items. Information relative to maximum capacities and other pertinent limitations affecting the mass or balance of the aircraft should be included in these instructions. When it is possible by adverse distribution of passengers and/or cargo to exceed the approved CG limits of the aircraft, special instructions should be issued to the pilot in command (PIC) and appropriate personnel so that the load distribution can be maintained within the approved limitation.

**C. Passenger Masses.** Actual masses or, average masses when authorized, are used to compute passenger loads over any segment of an operator's operations. Actual masses are generally used for GACAR Part 125 or 135 operations, or with aircraft carrying nonstandard passenger loads. As noted earlier, Actual Mass methods and Average Mass methods are authorized with E94. The Average Mass loading system should readily accommodate nonstandard mass groups and the manifest should indicate whether average or actual masses, or a combination thereof, were used in the computation.

1) *Average Passenger Mass.* The standard average passenger masses listed in FAA AC 120-27 (as amended), were developed for conventional airline passenger groups. They cannot be arbitrarily adopted for operations with passenger groups that appreciably differ

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from the basis or where the mix of male and female passengers is known to be different from a 60 percent male/40 percent female operation. Therefore, the operator will provide the GACA with a reliable survey to establish an average passenger mass for its specific operation. Special average mass or special ratios may be established for particular operations based on surveys that:

- Indicate that those masses consistently provide for loading within prescribed Mass and Balance limits
- Meet the criteria for surveys and statistical analysis in FAA AC 120-27

2) *Average Baggage Mass.* An operator may establish average passenger baggage masses predicated on a study of actual baggage masses for the operations or routes involved that consider seasonal and other variables.

**D. Passenger and Crew Baggage.** Procedures should be provided so that all baggage, including that carried onboard by the flight crew, is properly accounted for. If desired by the operator, (and authorized under OpSpec E94), a standard crew baggage mass may be used. Checked baggage average masses may also be used when authorized. In either case, actual masses should be used when checked baggage noticeably exceeds the average masses.

### 4.13.1.13. OPERATOR'S PASSENGERS AND CARGO LOADING PROCEDURES TRAINING.

**A. Responsibility for Mass and Balance Control.** Mass and balance control is one of the most important factors affecting safety of flight. An aircraft heavier than the maximum permissible mass or one whose CG is outside the allowable limits, is inefficient and dangerous to fly. The responsibility for proper mass and balance control begins with the air operator, extends to ground operations persons who load the aircraft, the maintenance personnel who maintains the aircraft, and the pilot who operates the aircraft. Normal loading of an aircraft using load persons must have procedures and training to ensure proper mass and balance, with a system to direct the proper loading of the aircraft within limits. The system must comply with the load manifest requirements of GACAR §§ 121.1517, 125.511 and 135.690.

1) *Responsibility.* The operator's training program must convey to the three employee groups (maintenance, ground operations, and flight operations) that although they have different functions in mass and balance control, each group has important responsibilities to

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ensure the safety of the operation.

2) *Operator Personnel Qualification Identification.* Employees involved in the loading of an aircraft must be trained, authorized, and qualified. This training must be easily identified by documentation in training records and authorization documents.

**B. Training in Mass and Balance Control.** Operators must have training programs for personnel involved with mass and balance control and calculations. These programs should contain the processes and procedures to maintain the mass and CG of aircraft dispatched. Topics in the training programs would include:

- Notification of flight crew
- Position of cargo and baggage
- Calculations for average masses of persons and baggage, seasonal changes, and unusual loads such as sports teams, military, and manifest masses of cargo, etc.
- Calculations for actual masses and when to use them
- Processes that take into account CG offsets for containers, both loaded into unit load devices (ULD) and loaded onto the aircraft
- Computer programs used, and processes and procedures to certify personnel to calculate mass and balance

**C. Training Program Curriculum.** Operators must provide:

1) *Programs for Pilots, Flight Engineers and Dispatchers.* Training programs for pilot, flight engineers and dispatchers are to include:

- Principles and methods for determining mass and balance
- Runway limitations for takeoff and landing
- Procedures to train flight crews in cargo loading awareness, to include examples of unserviceable ULDs, restraints, aircraft configuration, and duties and responsibilities

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of ground personnel

2) *Programs for Load Personnel.* Training programs for aircraft loaders are to include:

- Basic aircraft load procedures, such as step loading containers on all-cargo aircraft, loading containers in passenger aircraft, and bulk loading in lower lobes and upper lobes on all-cargo and combi aircraft
- Procedures for training load contractors and audit requirements for those contractors
- Training on expectations of loaders and proper load procedures, including safety and dangerous goods
- Frangible load requirements for certain positions

3) *Programs for Load Supervisors.* Training for persons responsible for the load on an aircraft must teach understanding of those responsibilities, to include ULD load, aircraft load, serviceability of ULDs, aircraft cargo handling, and restraint systems.

4) *Training on ULD Buildup.* Training on recognition of proper ULD configuration, including operational standards, net attachments, container configurations and condition, CG offsets, profiling, and authorization for use on particular aircraft. Training on how to build up a ULD to comply with CG control. Personnel to receive this training include contractors and freight forwarders.

5) *Programs for Freight Forwarders.* Programs should include procedures for training freight forwarders on air carrier/operator requirements, including ULD buildup with attention to CG offsets and profile.

6) *Programs for Maintenance Personnel.* Training for maintenance personnel must consist of:

- Aircraft weighing procedures
- Mass and balance changes due to alterations
- Cargo-loading system maintenance

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- Mass and balance control audit function under the Continuing Analysis and Surveillance System (CASS) Program (Part 121)
- Repair of ULDs and cargo restraint systems
- Inspection requirements
- Receiving inspection requirements for components contracted out
- Recording requirements

7) *Training on Records.* Programs should include procedures to retain training records for personnel trained in cargo loading and checking serviceability of ULDs. Training should address electronic recordkeeping and recurrent requirements.

### **4.13.1.15. PREREQUISITES AND COORDINATION REQUIREMENTS.**

#### **A. Prerequisites:**

- Knowledge of the regulatory requirements of Parts 91, 121, 125, and 135
- Previous experience with Part 121, 125, or 135 mass and balance control programs

**B. Coordination.** This task requires close coordination between GACA Airworthiness and Operations Inspectors.

### **4.13.1.17. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Parts 21, 23, 25, 27, 29, 43, 91, 121, 125, and 135
- FAA AC 120-27 (as amended), Aircraft Weight and Balance Control
- FAA AC 120-85 (as amended), Air Cargo Operations
- Approved AFMs

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- Aircraft Equipment Lists
- Aircraft Maintenance Records (Mass and Balance Records)
- FAA H-8083-1, Aircraft Weight and Balance Handbook
- Operations Manual (OM)
- Type Certification Data Sheets (TCDS) and Aircraft Specifications

### **B. Forms.**

- GACA Activity Report (GAR)

### **C. Job Aids.** None.

#### **4.13.1.19. PROCEDURES.**

**A. Coordinate with the Operator.** Applicable to the type of operation, the operator must submit the following for review:

- Operations Manual or revision
- Mass and Balance Control Program document (if not part of the Operations Manual)
- Pertinent company procedures
- Instructions for completing forms used in aircraft mass control and aircraft loading
- Mathematical justification for loading provisions or schedules
- Type of equipment
- Current method of recordkeeping

**B. Review the Operator's Mass and Balance Control Program, Procedures and Systems .** The operator's mass and balance control documentation must include procedures, levels of authority, and information appropriate to GACAR Part 121, 125, or 135. In addition, for Mass and Balance

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Control Program Manuals or documents independently controlled from the Operations or Maintenance Manual, the Inspector must confirm that the following are included:

1) Program document introduction to include:

- Description of the philosophy and the goals of the manual
- Description of the division of contents between volumes, if more than one volume
- List of Effective Pages (LEP), including dates

2) Program document revision and distribution procedures to ensure:

- Current information is provided to all manual holders
- Manuals are available to maintenance, operations, and ground personnel and are furnished to the GACA

3) Definitions of all significant terms used in the program. The definitions must reflect their intended use and include any acronyms or abbreviations unique to the manual.

C. In addition, all mass and balance control documentation must include the following:

1) Description of the organizational unit responsible for the control and maintenance of mass and balance control, to include:

- Definitions of lines of authority
- Description of the support structure

2) Training programs for the following:

- Maintenance personnel
- Pilots and Flight Engineers
- Operations and dispatch personnel

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- Ground handling personnel
- 3) A means of documenting and retaining individual training records.
- 4) A loading schedule consisting of graphs/tables or a special loading schedule for a calculator or computerized program. These schedules must ensure that pertinent data is available for all probable mass and balance conditions of the aircraft.
- 5) A load manifest on which all required loading information shall be entered by personnel responsible for mass and balance control, including procedures for:
- Completing the load manifest
  - Ensuring the load manifest is carried on the aircraft
  - Retaining the load manifest for the time periods specified in the GACARs
  - Distribution of the load manifest under GACAR §§ 121.1517, 125.511 and 135.690
- 6) Procedures to be used by crew members, cargo handlers, and other personnel concerned with aircraft loading, for the following:
- Distribution of passengers
  - Distribution of fuel
  - Distribution of baggage and cargo
  - Verification and acceptance of actual cargo mass as listed on a bill of lading
  - Restriction of passenger movement during flight, (if applicable)
  - Dangerous Goods requirements, (if applicable)
- 7) Procedures for:
- ULDs, including serviceability standards, CG offset, and buildup

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- Control and oversight of contractors, including freight forwarders
- 8) A drawing of each cargo and/or passenger configuration that includes emergency equipment locations.

**D. For operator's using Average Masses:**

- 1) Mathematical justification for loading provisions or schedules.
- 2) An alternate procedure for allowing manual computations, if a computerized mass and balance program is used.
- 3) Procedures for a mass range system, if applicable, that ensures:
  - The range is typical of passengers carried on similar operations
  - Computations for critical load considerations support the ranges
  - Personnel responsible for loading the aircraft are required to prepare appropriate loading records
  - The system includes methods for loading passengers whose masses are outside the range
  - Loading records indicate the number of passengers within the stated range and account for passengers who fall outside the range
- 4) A system for loading nonstandard mass groups, such as athletic squads or military groups and their baggage, which must use actual masses for both passengers and baggage.

**E. For all operator's:**

- 1) Procedures to verify actual mass of cargo.
- 2) Standards and schedules for calibration of commercial scales used to determine baggage/cargo masses.
- 3) Procedures to ensure that carry-on baggage is limited to articles that may be placed in

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overhead compartments or under seats. Carry-on baggage mass must be accounted for in the same manner as checked baggage or added to the average passenger mass.

**F. Analyze the Results.** Upon completion of review, analyze the results and determine whether the operator's manual and OpSpecs meet all requirements.

**G. Meet with Operator.** Discuss any discrepancies with the operator and advise them on areas that need corrective action.

### 4.13.1.21. CARGO HANDLING PROCEDURES.

**A. Cargo.** Procedures must be provided for loading/unloading freight into upper main cargo compartments on all-cargo and combi aircraft and into lower lobe compartments on all aircraft. This includes forward and/or aft compartments on regional type aircraft as well as cargo pods. Cargo handling should include procedures for:

- 1) Loading, based on aircraft configuration (i.e., all-cargo, passenger, combi, and convertible). These procedures may vary depending on the type of cargo handling system installed, restraint equipment installed or used, and cargo door configuration.
- 2) Loading aircraft to ensure that tail tipping does not occur.
- 3) Loading for passenger and cargo aircraft so that containers, if used, are loaded onto the aircraft and restrained.
- 4) Ensuring that, if bulk loaded on lower lobe, forward, aft compartments, or pods, cargo or baggage is properly restrained using the restraint system required by the aircraft mass and balance documents.
- 5) Ensuring that cargo bulk-loaded on the main deck is loaded per the original equipment manufacturers and operator's mass and balance procedures.

**B. ULD.** ULDs are certified to a Technical Standard Order (TSO) or other standard acceptable to the President. Uncertified ULDs are built to an industry standard and are not allowed on aircraft unless approved by the President. Operators must have procedures for the following:

- 1) Procedures on buildup of containers and pallets to ensure proper CG control so as not to

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exceed certification limitations for horizontal and vertical CG.

- 2) Buildup procedures for palletized and bulk cargo that ensure that the load fits the fuselage profile of the aircraft being loaded.
- 3) CG offsets control to ensure that loaded pallets or containers do not exceed certification limitations for horizontal and vertical CG. Bulk load procedures ensure that the load does not exceed CG offset for the compartment being loaded. This would include ULDs loaded in double configuration with vacant adjacent positions.
- 4) Procedures to ensure that ULDs are operational before loading on an aircraft, and designate a responsible person to perform these checks and validate to the flight crew on the load sheet, manifest, or other form, that operational checks have been performed.
- 5) Operators should have a program to maintain ULDs under the ULD manufacturer's recommendations or procedures developed by the operator and acceptable to the GACA. This program should include serviceability limits, inspection limits, inspection frequency, and receiving inspection requirements. Control of ULDs should be shown along with reweigh procedures to establish tare masses.
- 6) Procedures to route unserviceable ULDs to repair facilities should be established, along with procedures to add repair facilities to approved vendor lists.

**C. Active ULDs.** Active ULDs are ULDs with active temperature control systems for transporting temperature-sensitive (Cool Chain) cargo.

- 1) Unlike the typical ULD (or "Can"), active ULDs are capable of heating and/or refrigerating as required. These systems consist of a highly insulated container with a battery-operated heating/cooling system integrated into the construction of the container. ULDs are battery-powered in flight and are only recharged while on the ground. The "active" component of these units consists of a vapor cycle refrigeration/heat pump type system that is powered by various types of large batteries, depending on the manufacturer.
- 2) Only Active ULDs approved under GACAR Part 21 may be used on Saudi Arabian-registered aircraft. Additionally, if an operator intends to deploy these containers in their fleet, they should follow the guidance in FAA AC 120-85 (as amended), Air Cargo Operations, and, at a minimum, prepare the following in their manual:

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- a) Operators must have procedures that ensure that only containers that are properly prepared, and which meet the handling and airworthiness requirements of the manufacturer, are carried on an aircraft. The operator should address these requirements in the appropriate manual.
- b) The maintenance and inspection procedures are normally derived from the active ULD manufacturers' instructions for continued airworthiness (ICA) and/or limitations documents. This program must also include training to ensure that only qualified personnel perform maintenance and return these devices to service in accordance with the operators' procedures.

**D. Other Restraints.** Restraints, such as straps, tie-downs, nets, etc., may be certified during the original type certification, amended type certification, or by STC. The restraints that are allowed on an individual aircraft are listed in the approved operating data for each aircraft.

### 4.13.1.23. CARGO HANDLING SYSTEMS.

**A.** Cargo handling systems, both upper and lower deck, must be approved under GACAR Part 21. These systems consist of locks, end stops, vertical side restraints, ball mats, roller sections, side guides, etc. Cargo handling systems are also designed as a conveyance for ULDs, allowing them to move easily in and out of the aircraft. In addition, some cargo handling systems are powered.

**B.** Repair of system components should be part of the operator's manual system, along with the ability to substitute load-bearing components. Substitution should be based on GACA-approved data. Substitution would include those subparts of a load-bearing component. The operator should show that, if substitution is done, it is backed up with approved data. The operator's manual system should show the modified configuration and how that configuration is controlled. That control may be in the form of an Engineering Order (EO), Engineering Report, or other vehicle described in the operator's manual.

**C.** No matter the means of approval used, minimum equipment list (MEL) concerns should be addressed. This includes operation with missing restraint devices along with mass and/or performance penalties for the missing device.

### 4.13.1.25. CONTRACTORS.

An operator may use a contractor to load aircraft, weigh items, load

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baggage, etc. However, the operator is responsible for ensuring that the contractor complies with the operator's mass and balance control program, procedures and systems. In addition, the operator must have procedures for the following:

- A. Freight Forwarders.** Procedures to train freight forwarders or contract loaders under the operator's requirements. Procedures to audit forwarders or contractors.
- B. Interlining.** Procedures to ensure that ULDs received from other operators, whether Kingdom of Saudi Arabia (KSA) or foreign, meet the gaining operator's requirements for load and serviceability.

### **4.13.1.27. TASK OUTCOMES.**

- A. Complete the GAR.**
- B. Complete the Task.** Approve the applicable OpSpecs.
- C. Document the Task.** File all supporting paperwork in the operator's GACA office file.

### **4.13.1.29. FUTURE ACTIVITIES.**

- A.** The Inspectors are to review their assigned operator's mass and balance control programs, procedures and systems. This review shall include the subject areas discussed in this chapter, along with the appropriate operator's manuals and OpSpecs. Inspectors should review any training program their operator accomplishes for personnel who supervise the loading of aircraft, prepare load manifest forms, or qualify and authorize other persons to accomplish these requirements.
- B.** Maintenance weighing records, training records, and air cargo operations audit records must reflect compliance with the mass and balance control programs, procedures and systems. Cargo handling systems and ULDs must have records of maintenance, preventive maintenance, and inspections located in the aircraft maintenance records.
- C.** Ground operations load manifest records, load verification sheets, and personnel training records must reflect compliance with the mass and balance control procedures.
- D.** Flight operations records and personnel training records must reflect compliance with the

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mass and balance control procedures.

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**CHAPTER 13. MASS AND BALANCE FOR PARTS 121, 125 AND 135**

**Section 2. Empty Aircraft Mass and Balance Control**

**4.13.2.1. GACA ACTIVITY REPORT (GAR).**

- A. 1302 (OP) (Initial)
- B. 1303 (OP) (Revision)
- C. 3328 (AW) (Initial)
- D. 3329 (AW) (Revision)

**4.13.2.3. OBJECTIVE.** This section provides guidance for evaluating/approving the process General Authority of Civil Aviation Regulation (GACAR) Part 121, 125 or 135 operators utilize to determine empty aircraft mass and balance.

**4.13.2.5. CERTIFICATION BASIS (TYPE CERTIFICATE (TC)/AMENDED TC/SUPPLEMENTAL TYPE CERTIFICATE (STC)).**

- A. In general, when an aircraft is issued a Type Certificate (TC), the accompanying Type Certificate Data Sheet (TCDS) includes all of the pertinent specifications for the aircraft. This includes limitations for maximum mass and center of gravity (cg) envelopes. The mass and balance information is located in the TCDS under the pertinent data to all models.
- B. Conformity to type design is considered attained when the required and proper components are installed, and they are consistent with the drawings, specifications, and other data that are part of the TC.
- C. Before an aircraft can be properly weighed and its empty-mass center of gravity (EMCG) computed, the equipment list that comprises the basic operating mass (BOM) of the aircraft must be validated to ensure that it is current.

**4.13.2.7. AIRCRAFT MASSES.** As stated in GACAR § 91.11, all Saudi Arabian registered aircraft

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must be weighed every 36 months unless: the aircraft was issued an original airworthiness certificate within the preceding 36 months or the aircraft is operated under an Empty Aircraft Mass and Balance Control Program approved in the operations specifications (OpSpecs) issued to the operator.

- A. Typically, aircraft operated under Parts 125 and 135 elect to be weighed at least once every 36 calendar-months. The operator's manuals must reflect this requirement.
- B. If an operator (typically those under GACAR Part 121) chooses, they may elect to be weighed at other intervals as contained in a General Authority of Civil Aviation (GACA)-approved Empty Aircraft Mass and Balance Control Program and will be issued OpSpec E96.

**NOTE:** Additional information may be found in FAA AC 43.13-1, Chapter 10, (as amended), Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair.

### 4.13.2.9. WEIGH SCALES.

- A. Scales used to weigh aircraft must be calibrated and traceable to a standard or equivalent standards acceptable to the President. Calibration must be performed in accordance with the civil authority for masses and measures having jurisdiction over the area in which the scales are used. The frequency of calibration testing depends on use and handling.
- B. Periodic testing of scales using a known mass to ensure accuracy should be included in an operator's program.
- C. If a scale is out of calibration, it may be used if there is a procedure in place to verify accuracy using a known mass that is representative of the load to be carried.

### 4.13.2.11. VERIFYING MAINTENANCE DOCUMENTATION PROCEDURES.

#### A. Addition or Removal of Equipment.

1) *CG Change after Repair or Alteration.* The largest mass changes of empty mass that occur during the lifetime of an aircraft are those caused by alterations and repairs. It is the responsibility of the operator doing the work to accurately document the mass change and record it in the aircraft record.

- a) When operators make conversions, modifications, repairs, or major alterations to an

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aircraft that change the current mass and balance requirements and/or limitations, the GACA generally approves a mass and balance supplement or other control documents, such as STCs; or other mass and balance reports. This supplementary information describes the effect of the conversion or modification on the aircraft, and the GACA generally approves it as part of an STC.

b) When an operator makes a conversion, modification, or major alteration to an aircraft that changes its mass and balance characteristics, the air operator should have a procedure in place to ensure that all supplemental information developed, issued, and approved for that aircraft is incorporated into the operator's Mass and Balance Control Program (if applicable). An operator must apply the most restrictive ranges of the incorporated modifications to the operation of that aircraft. For example, if multiple STCs apply, the operator must use the STC with the most restrictive mass and balance limitations when updating the empty mass and center of gravity data for their aircraft. In all cases of multiple STCs applied to a single aircraft, the STCs should be evaluated for effect on each other and the appropriate limitations applied. At a minimum, an operator should:

- Include the supplemental information described above or cross-reference the supplemental information in the operator's empty aircraft mass and balance procedures
- Organize the supplemental information according to aircraft type or in a way that facilitates use by loading personnel

c) Include the supplemental information in its operator's empty aircraft mass and balance documentation and any charts or tables that indicate proper mass and CG range limitations.

### 2) Permanent Ballast.

a) If a repair or alteration causes the aircraft CG to fall outside of its limits, permanent ballast can be installed. Permanent ballast may consist of blocks of lead or other material. It should be marked, "Permanent Ballast/Do Not Remove." It should be attached to the structure so that it does not interfere with any control action, and be attached rigidly enough that it cannot be dislodged by any flight maneuvers or rough landing.

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- b) Two things must first be known to determine the amount of ballast needed to bring the CG within limits: the amount the CG is out of limits, and the distance between the location of the ballast and the limit that is affected.
- 3) *Temporary Ballast.* Temporary ballast, in the form of lead bars or heavy canvas bags of sand or lead shot, is often carried in the baggage compartments to adjust the balance for certain flight conditions. The bags should be marked as ballast and secured. Removal may require recalculation of the aircraft empty mass. Temporary ballast must be secured so that it cannot shift its location in flight, and the structural limits of the baggage compartment must not be exceeded. All temporary ballast must be removed before the aircraft is weighed.

### B. Mass and Balance Revision Record.

- 1) Each revision record should be identified by the date and the aircraft make, model, and serial number. The pages should be signed by the person making the revision.
- 2) The computations for a mass and balance revision are included on a Mass and Balance revision form. Appropriate fore and aft extreme loading conditions should be investigated and the computations shown. The Mass and Balance revision sheet should clearly show the revised basic empty mass, basic operating mass, empty mass arm, and/or moment index.

**NOTE:** The basic operating mass (BOM) is defined as the mass of an aircraft with unusable fuel, all fluids, crew, and installed equipment, as defined by the operator's program based on TC, STC, or other GACA-approved data.

#### 4.13.2.13. PROCEDURES.

**A. Review the Operator's Empty Aircraft Mass and Balance Control Documentation.** The operator must describe their empty aircraft mass and balance control systems in the operations and/or maintenance manual and/or a dedicated Empty Aircraft Mass and Balance Control Program document. In either case, the documentation must include procedures, levels of authority, and information appropriate to Part 121, 125, or 135. In addition, the aviation safety inspector (Inspector) must confirm that the following are included:

- Determining standards and schedules for calibration of aircraft scales
- Pre-weighing instructions and requirements

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- Determining which aircraft are to be weighed
- Establishing and maintaining BOM equipment lists for each aircraft
- Recording the type and serial number for each scale used, airplane mass, residual fluids, and scale tare masses
- Initial weighing of aircraft
- Monitoring and adjusting individual aircraft or fleet, empty mass, and CG
- Periodic reweighing of aircraft
- Ensuring aircraft are configured under approved data

### **4.13.2.15. TASK OUTCOMES.**

**A. Complete the GAR.**

**B. Complete the Task.** Issuance of OpSpec E96 (if applicable).

**C. Document the Task.** File all supporting paperwork in the operator's GACA office file.

### **4.13.2.17. FUTURE ACTIVITIES.** Normal surveillance.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 14. AVIATION WEATHER INFORMATION SYSTEMS FOR PARTS 121 AND 135**

##### **Section 1. General Information**

###### **4.14.1.1. GENERAL.**

A. This chapter provides the following information:

- Assistance to aviation safety inspectors (Inspectors) who approve or accept methods which operators may use to collect, evaluate, and disseminate weather information
- Specific instructions for Inspectors evaluating weather information systems
- Information to assist Inspectors in completing routine job assignments associated with Part 121 and Part 135 weather information systems
- Information about selected types of operators with special needs

B. It is not intended that this chapter provide a detailed explanation of meteorology or aviation weather reporting and forecasting methods. Inspectors who evaluate weather information systems should already have a sound understanding of meteorology, including weather reporting and forecasting requirements.

###### **4.14.1.3. AERONAUTICAL WEATHER DATA.** Aeronautical weather data is meteorological information used to plan and control flight and ground operations. This data includes information such as the following:

- Aerodrome forecasts and reports
- Surface aviation weather reports
- Pilot reports
- Radar reports

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- Satellite pictures
- Aviation weather forecasts
- Tropopause height and temperature
- Severe weather outlook charts
- Weather depiction charts
- Radar summary charts
- Surface analysis charts
- Significant weather prognostic charts

### **4.14.1.5. POLICY ON CONDITIONAL PHRASES IN REMARKS PORTION OF WEATHER FORECAST.**

**A. Conditional Phrases.** Weather forecasts provided by meteorological service providers may include conditional phrases such as “occasional,” “intermittently,” “chance of,” or “tempo” in the remarks portions of the forecasts. These phrases supplement the main body of the forecast by indicating the probability of changing conditions during the forecast period. These modifying phrases, used in the remarks portion of a terminal forecast, indicate the weather conditions for an area within five nautical miles of a runway complex. Certain regulations concerning the selection of destination and alternate aerodromes require that “weather reports or forecasts, or any combination thereof, indicate that the weather conditions will be at or above...” the minimum weather conditions specified in those regulations. The President interprets these regulations to mean that the worst weather condition in any of the reports or forecasts used to control a flight movement is the controlling factor. These interpretations make the remarks portion of a forecast as operationally significant as the main body of the forecast. Therefore, it is General Authority of Civil Aviation (GACA) policy that the worst weather condition in the main body or the remarks portion of a terminal forecast, as well as any weather report used, is the controlling factor when selecting a destination or alternate aerodrome.

**B.** This policy must be applied when determining compliance with the following regulations:

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- GACAR § 121.369 - Dispatch or Flight Release under IFR or Over the Top
- GACAR § 121.1373 - Dispatch or Flight Release Over Water
- GACAR § 121.1393 - Alternate Aerodrome for Destination: IFR or Over the Top
- GACAR § 121.1401 - ETOPS Alternate Aerodromes
- GACAR § 121.1397 - Alternate Aerodrome Weather Minimums
- GACAR § 135.665 - IFR: Destination Aerodrome Weather Minimums
- GACAR § 135.667 - IFR: Alternate Aerodromes
- GACAR § 91.185 - IFR Flight Plan: Information Required

### **4.14.1.7. POLICY FOR DETERMINING THE CONTINUED ADEQUACY OF WEATHER REPORTS AND OBSERVATIONS.**

**A.** The purpose of regulations which establish weather minimums, or which require flight crews and dispatchers to consider weather conditions, is to prevent unsafe flight operations. The phrases “current weather” and “latest weather report” have occasionally been interpreted inappropriately, resulting in diminished safety of flight operations and in noncompliance with the GACARs.

**B.** Because weather conditions can change rapidly, a continuing watch over weather conditions must be maintained wherever GACAR Part 121 or Part 135 terminal operations are conducted. For surface weather observations to be considered “current,” one of the following two conditions must be met:

- 1) A specifically approved automated weather observation system must be fully operational while terminal area flight operations are conducted.
- 2) An observer station must be fully operational and must maintain a basic weather watch as follows:
  - a) For scheduled operations, a basic weather watch must begin in time to make an

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observation available to pilots and dispatchers at least 30 minutes before the estimated time of arrival or departure. The basic weather watch may not be discontinued until the arrival or departure is completed.

b) For unscheduled operations, the basic weather watch should begin at least 30 minutes before the estimated time of arrival or departure and must begin in time to provide pilots with an observation before beginning the approach or departure. The basic weather watch must not be discontinued until the arrival or departure is completed.

### **4.14.1.9. SOURCES FOR TECHNICAL ASSISTANCE AND METEOROLOGICAL REFERENCES.**

When evaluating weather information systems, an Inspector should not hesitate to contact the Presidency of Meteorology and Environment (PME) for technical assistance and expertise. An Inspector who encounters situations which are not addressed in this handbook should contact the Director, ANS Safety Division for technical assistance. Additional meteorological information can be found in the following selected references:

- Federal Aviation Administration (FAA) Advisory Circular (AC) 00-6A (as amended), Aviation Weather.
- GACA Aeronautical Information Publication, Part 1 General, 3.5

### **4.14.1.11. DEFINITIONS, ACRONYMS, AND INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) EQUIVALENT TERMS.**

#### **A. Definitions.**

1) *Part 121/135 Weather Information System.* When used in this handbook, a weather information system is a system acceptable to the President for gathering and disseminating aeronautical meteorological data.

2) *Weather Report.* When used in this handbook, the term “weather report” means a report of meteorological conditions observed at a specific time and location. Examples include PIREPs and SAs.

#### **B. Acronyms.**

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- **AIRMET** - Airman's Meteorological Information (an inflight advisor forecast of possibly hazardous conditions including moderate icing or turbulence, sustained surface winds exceeding 30 knots, and widespread low ceilings)
- **SIGMET** - Significant Meteorological Information (including an inflight advisory forecast of weather; potentially hazardous to all aircraft)

**C. ICAO Equivalent Terms.** ICAO meteorological terms and acronyms have been adopted for use in the Kingdom of Saudi Arabia and these term differ somewhat from terms commonly used elsewhere in the world (e.g. the United States). A complete list of ICAO terminology can be found in "Meteorological Service for International Air Navigation" Annex 3 (ICAO) and "Manual of Aeronautical Meteorological Practice" Doc 8896- AN/893/3 (ICAO).

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 14. AVIATION WEATHER INFORMATION SYSTEMS FOR PARTS 121 AND 135**

##### **Section 2. Weather Products and Approval Process**

**4.14.2.1. BACKGROUND.** This section gives an overview of the joint efforts of the Presidency of Meteorology and Environment (PME) and the General Authority of Civil Aviation (GACA) Air Navigation Services (ANS) Sector, to provide accurate and timely weather observations and forecasts to the aviation community. This background is presented to help principal operations inspectors (POIs) better understand the relationship between the PME and the GACA ANS Sector, the different classifications of aviation weather products, and, most importantly, the use and approval of commercial aviation weather products to fulfill regulatory requirements.

A. Under GACAR Part 179, the PME has responsibility for collecting and producing aviation weather data in the Kingdom of Saudi Arabia (KSA), and under GACAR Part 175 has joint responsibility with the GACA Air Navigation Services Sector for disseminating aviation weather data. The PME provides basic meteorological services and mutually agreed upon aviation weather services. GACA-Safety & Economic Regulation (S&ER) establishes user requirements for aviation weather services, determines which entities will be authorized to provide specific weather services to operators, and verifies that the aviation weather services meet the established General Authority of Civil Aviation Regulation (GACAR) requirements.

**NOTE:** Guidance on the subject of coordination between GACA ANS Sector and the PME is contained in the Manual on Coordination between Air Traffic Services, Aeronautical Information Services, and Aeronautical Meteorological Services (see ICAO Doc 9377).

**4.14.2.3. SOURCES OF AVIATION WEATHER INFORMATION.** Each operator conducting scheduled operations must adopt and put into use an approved system for obtaining forecasts and reports of adverse weather phenomena, such as clear air turbulence, thunderstorms, and low altitude windshear that may affect safety of flight on each route to be flown and at each aerodrome to be used.

A. For operations within the Kingdom of Saudi Arabia (KSA), the PME has been authorized by the President under GACAR Part 179 to be responsible for the collection and preparation of weather data, including forecasts. Consequently, the term “authorized source(s)” refers

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exclusively to meteorological data and information sourced by the PME.

**B.** For operations conducted outside of KSA airspace, weather data must be prepared by a source acceptable to the President.

**C.** Each operator using forecasts to control flight movements must use forecasts prepared from weather reports specified in subparagraphs A and B above.

**D.** There are three distinct types of weather information that operators may need to conduct operations:

- *Observations.* Raw weather data collected by some type of sensor suite, including; surface and airborne observations, radar, lightning, satellite imagery, and profilers
- *Analysis.* Enhanced depiction and/or interpretation of observed weather data
- *Forecasts.* Predictions of the development and/or movement of weather phenomena based on meteorological observations and various mathematical models

**NOTE:** In-flight weather advisories, including Significant Meteorological Information (SIGMET), and Airman's Meteorological Information (AIRMET) are considered forecast-type weather information or forecast products.

### **4.14.2.5. AUTOMATED WEATHER OBSERVATION SYSTEMS.**

**A.** Automated weather observing systems can be deployed in a variety of configurations and may be operated by the meteorological service provider at both manned and unmanned locations.

### **4.14.2.7. WEATHER REPORTS.**

**A. Weather Information Required in Reports Used to Control Approaches and Departures.** All GACAR Part 121 and 135 operators must use approved sources of weather reports of meteorological conditions at any aerodrome where instrument flight rules (IFR) departures or approaches are conducted. When authorized, an approved source may rely on specifically approved automated observation equipment for some or all of the required weather information.

- 1) When GACAR Part 121 or 135 operators are required to use a weather report, the report

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will normally contain the following meteorological information:

- Time of observation
- Visibility
- Altimeter setting
- Temperature
- Dew point
- Wind speed
- Wind direction
- Cloud height

2) When GACAR Part 121 or 135 operators are required to use a weather report to commence an approach or determine if a departure alternate is required, the report must contain at least the following meteorological information:

- Time of observation
- Visibility
- Altimeter setting (unless using approach minimums with an alternative remote altimeter setting)
- Temperature (temperature may be missing if the operator has a General Authority of Civil Aviation (GACA)-approved method of determining the temperature for takeoff or landing)
- Wind speed and direction (from either the weather report or via local ground communications)
- Cloud height (if specifically required for the approach or departure procedure)

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### **4.14.2.9. CLASSIFICATION OF AVIATION WEATHER PRODUCTS.**

**A.** GACA differentiates between weather products that may be used to comply with regulatory requirements and those that may only be used to improve situational awareness. To clarify the proper use of aviation weather products to meet the requirements of the regulations, GACA recognizes the following definitions:

- 1) *Primary Weather Product.* An aviation weather product that meets all the GACAR requirements for aircraft operations and safety needs for use in making flight-related aviation weather decisions.
- 2) *Supplementary Weather Product.* An aviation weather product that may be used for enhanced situational awareness. If used, a supplementary weather product must only be used in conjunction with one or more primary weather products.

**NOTE:** An aviation weather product produced by a MET service provider authorized under GACAR Part 179 (i.e. the PME) or an alternate source acceptable to the President (outside the KSA) is a primary product unless designated as a supplementary product by GACA.

**B.** Defining primary and supplementary weather products helps differentiate between those that may be used to meet regulatory requirements and other products that may only be used to improve situational awareness.

**C.** All flight-related, aviation weather decisions must be based on primary weather products. Supplementary weather products augment the primary products by providing additional weather information, but may not be used as stand-alone products to meet aviation weather regulatory requirements or without the relevant primary products. When discrepancies exist between primary and supplementary products pertaining to the same weather phenomena, users must base flight-related decisions on the primary weather product. Furthermore, multiple primary products may be necessary to meet all aviation weather regulatory requirements.

**D.** GACA may choose to restrict certain weather products to specific types of usage or classes of user.

### **4.14.2.11. APPROVAL AND USE OF COMMERCIAL WEATHER PRODUCTS.**

**A.** Operators may seek approval for the use of weather products outside the suite of

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PME-supplied aviation weather products. These would fall under the “supplementary weather product” category and as such, POIs should consider the following:

- 1) Ultimate approval of such aviation weather products must come from the Director, ANS Safety Division before the POI can evaluate their use by operators.
- 2) If a proprietary weather product is to be used to determine actions required for regulatory compliance, that product must contain at least the same information available from the PME-supplied product(s) upon which that determination would otherwise be made.
- 3) For operators to use proprietary products in making flight-related decisions, appropriate training to ensure the proper use of the product and any additional necessary guidance must be included in Operations Specifications (OpSpecs) A09, and provided to flight crewmembers and dispatchers.
- 4) Proprietary products, as defined herein, do not include aircraft equipment. This aircraft equipment must be approved under GACAR Part 21.

**B.** When authorizing the use of weather products for operators certificated under GACAR Part 119, POIs are expected to coordinate their activities with the ANS Safety Division in order to ensure a thorough evaluation of the proposed weather information system.

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#### **CHAPTER 14. AVIATION WEATHER INFORMATION SYSTEMS FOR PARTS 121 AND 135**

##### **Section 3. Weather Information Systems**

**4.14.3.1. REGULATORY REQUIREMENTS FOR WEATHER INFORMATION.** There are many regulations and International Civil Aviation Organization (ICAO) Standards and Recommended Practices which directly establish specific weather information requirements. General Authority of Civil Aviation Regulation (GACAR) Part 121 and 135 both specify that weather reports or forecasts must indicate the destination aerodrome (at time of arrival) will be at or above the authorized minimums before an instrument flight rules (IFR) flight can begin. Other regulations specify weather information requirements indirectly, even though the requirements are not specifically referenced in the GACAR titles or text. In such cases, an operating requirement is established which cannot be complied with unless specific weather data is available during preflight planning and while the aircraft is aloft. For example, both GACAR Part 121 and 135 establish aircraft performance standards. These regulations indirectly require appropriate means for determining the probable temperature, pressure altitude, and other weather factors (which will exist at the time of dispatch or flight release) necessary for calculating the aircraft's performance capabilities.

**NOTE:** For Part 135 operations under visual flight rules (VFR), the PIC may, if such a report is not available, use weather information based on that pilot's own observations or on those of other persons competent to supply appropriate observations. For this purpose, the GACA considers certificated commercial pilots, airline transport pilots, dispatchers, air traffic controllers, and trained weather observers to be competent to provide weather information for GACAR Part 135 VFR operations (see GACAR § 135.659).

**4.14.3.3. GENERAL CHARACTERISTICS OF A WEATHER INFORMATION SYSTEM.** Each operator under GACAR Part 121 or Part 135 must have methods for gathering and disseminating aeronautical meteorological data. Weather information systems must rapidly disseminate accurate and complete weather information in formats that are operationally suitable for use by flight crews, dispatchers, and other operational control personnel. All aeronautical weather systems include equipment and personnel to collect, process, and disseminate reports of weather observations and forecasts. These systems must include reliable methods for communicating weather information between appropriate ground facilities and between ground facilities and aircraft during ground and

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flight operations.

**4.14.3.5. WEATHER INFORMATION SYSTEMS OPERATIONAL REQUIREMENTS.** A weather information system must provide at least that meteorological information needed to conduct all phases of flight operations in consideration of operational and regulatory requirements. Weather products (aviation weather information) which must be provided by a weather information system are discussed in the following paragraphs. These weather products are common to weather information systems used by both GACAR Part 121 and Part 135 operators.

**4.14.3.7. OPERATIONAL REQUIREMENTS – FLIGHT CREWS.** Flight crews need accurate weather information to determine the present and forecast weather conditions on any planned operation. For example, for adequate flight planning, flight crews should know existing and expected weather conditions at the departure aerodrome, along the planned route of flight, and at destination, alternate, and diversionary aerodromes. While inflight, flight crews should be able to obtain current surface weather observations and updated forecasts. When a significant change in observed weather data occurs, the location, intensity, and movement of the phenomena affecting flight operations should be updated and made available to en route aircraft.

**A. Preflight Planning.** Operational flight planning decisions require consideration of the following weather information:

- Terminal forecasts for departure, destination, alternate, and diversionary aerodromes
- Winds and temperatures aloft for various route segments at planned cruising altitudes
- Surface observations for departure, destination, alternate, and diversionary aerodromes
- NOTAMs for departure/destination/alternate/ diversionary aerodromes and navigation NOTAMs (if not provided by other means)
- Area forecasts
- Information to determine the density altitude at points of takeoff and landing
- AIRMETs and SIGMETs
- Thunderstorms (location, intensity, movement, direction, and speed)

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- Squall lines located or forecast to occur along the route of flight
- Areas of heavy precipitation
- Freezing levels
- Icing (location, type, and severity)
- Turbulence (intensity, type, areas, and altitudes of occurrence)
- Hail (areas of occurrence)
- Volcanic Ash
- Pilot reports
- Mountain waves (standing lenticular clouds, rotor clouds)
- Tornadoes (waterspouts, funnel clouds)
- Low level windshear

**B. Inflight Weather Advisories.** Inflight weather advisory requirements available from a weather information system include the following:

- Updated areas of adverse weather (such as thunderstorms, turbulence, and heavy precipitation)
- Updated reports and forecasts of winds and temperatures aloft
- Updated reports and forecasts of destination and alternate aerodrome weather
- Reports or forecasts of unanticipated weather conditions below landing minimums at aerodromes specified in a dispatch, flight release, or flight plan

### **4.14.3.9. OPERATIONAL REQUIREMENTS - DISPATCH AND/OR OPERATIONAL**

**CONTROL PERSONNEL.** Dispatchers and other operational control personnel need current and forecast weather information to plan, control, direct, or terminate flight operations. These personnel

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require updated information for long term planning and for assisting flight crews inflight who are required to amend their flight plans due to changing weather, changing aerodrome conditions, mechanical difficulties, or any other reason. Operational control personnel must be able to keep crews informed of reported or forecast adverse weather phenomena.

**A.** All weather information systems must provide dispatch/operational control personnel with access to at least the meteorological information associated with the following kinds of weather products:

- Surface weather analysis and prognosis charts
- Radar summary chart
- Severe weather outlook charts
- Upper winds and temperature information
- Weather depiction charts
- Freezing level charts
- Terminal and area forecasts
- Aviation weather observations (surface reports)
- Pilot weather reports
- Hazardous weather reports and depiction charts
- Weather advisories (such as SIGMETs, and AIRMETs)

**B.** Weather information systems which support flight operations above 18,000 feet must provide the following additional information:

- High level severe weather information (clear air turbulence)
- Tropopause height information

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- Vertical windshear information
- Constant pressure charts
- Constant pressure analysis charts (5 levels)
- High level (400 - 70 millibars) significant weather prognosis

### **4.14.3.11. ADVERSE WEATHER PHENOMENA REPORTING AND FORECASTING**

**REQUIREMENTS.** Per GACAR § 121.93(b), any weather information system used in schedules operations under GACAR Part 121 must include an Adverse Weather Phenomena Reporting and Forecasting subsystem. These subsystems allow operators to monitor weather reports from various sources in their operation to quickly and accurately identify adverse weather phenomena, and to predict their effects on safety of flight and ground operations. These subsystems must include forecasting abilities which are at least equal in capability to weather system forecasting abilities under GACAR Part 179 and which are specifically oriented to the operator's operational needs with respect to adverse weather phenomena.

**A. Adverse Weather Phenomena.** Adverse weather phenomena are meteorological conditions which, if encountered inflight or during ground operations, could directly diminish safety of an operation. The following meteorological conditions are considered by GACA to be adverse weather phenomena:

- Strong surface winds (exceeding 30 knots)
- Widespread low ceilings and/or visibilities which affect selection of destination and alternate aerodromes
- Active thunderstorms (particularly those with increasing intensity levels)
- Moderate or severe inflight icing
- Icing which affects ground operations (including snow, freezing rain or drizzle, ice fog, or sleet)
- Severe or extreme turbulence (including clear air and mountain wave)

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- Low altitude windshear (below 2000 feet above ground level (AGL))
- Occurrence of unforecast weather conditions below landing or takeoff minimums
- Volcanic ash
- Sandstorms and dust storms
- Meteorological conditions which contaminate a runway surface and adversely affect aircraft performance or prohibit use of a runway

### **B. Capabilities of Adverse Weather Phenomena Reporting and Forecasting Subsystems.**

Adverse Weather Phenomena Reporting and Forecasting subsystems must meet all the following criteria:

- Provide direct access to sources of weather information capable of identifying, reporting, and forecasting adverse weather phenomena which could directly diminish the safety of a scheduled flight or ground operation
- Incorporate methods to modify forecasts of adverse weather phenomena when reports indicate adverse weather of different severity than originally forecast
- Contain methods and procedures to collect and evaluate adverse weather information
- Use effective and timely methods to disseminate the potential effects of adverse weather to flight crews and other company personnel responsible for operational control functions
- Incorporate methods for describing the location of adverse weather phenomena with reference to navigational fixes or locations (the fixes or locations should be displayed on navigation charts, weather plotting charts, other inflight operational charts or displays normally used during the certificate holder's en route operations)
- Incorporate methods for suspending, restricting, or modifying (as necessary) flight operations affected by adverse weather
- Provide continuous and direct on duty participation of a certificated dispatcher or aviation meteorologist

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- Use pilot/dispatcher communications which meet at least the GACAR requirements applicable to Part 121 scheduled operations

### **4.14.3.13. APPROVAL OF ADVERSE WEATHER PHENOMENA REPORTING AND FORECASTING SUBSYSTEMS.**

**A. Requests for Approval.** All Adverse Weather Phenomena Reporting and Forecasting subsystems used by an operator must be GACA approved. Any operator required to use an approved Adverse Weather Phenomena Reporting and Forecasting subsystem must make a written request for approval to the President. The initial request must describe the planned subsystem in sufficient detail for the principal operations inspector (POI) to evaluate the proposal. This request must be accompanied by proposed manual materials, details of any contractual arrangements, and resumes of key personnel used in the subsystem or employed by any commercial weather service involved.

**B. Evaluations and Inspections of Adverse Weather Phenomena Reporting and Forecasting Subsystems.** Before approving the use of a subsystem, the POI, working in conjunction with Inspectors from the ANS Safety Division, must evaluate the submitted material with the request for approval and conduct inspections of the facilities, equipment, and other components. The POI must also verify the professional qualifications and training of meteorologists and dispatchers who will be used in the Adverse Weather Phenomena Reporting and Forecasting subsystem. When the POI has determined the proposed subsystem complies, the subsystem may be approved for use by the operator.

### **C. Approval or Denial of Adverse Weather Phenomena Reporting and Forecasting Subsystems.**

- 1) An Adverse Weather Phenomena Reporting and Forecasting Subsystem must be approved by the Director, ANS Safety Division before its use by a certificate holder/operator can be evaluated and approved by the POI.
- 2) Approval for an operator to use an Adverse Weather Phenomena Reporting and Forecasting subsystem shall be accomplished by issuing operations specification (OpSpec) A9 with a description of the subsystem or reference to the operator's manual. Any proposed revisions to the subsystem, including manual material, should be evaluated and inspected by the GACA as soon as possible and a revised OpSpec A9 must be issued when warranted.

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3) If after evaluation and inspection, either the Director, ANS Safety Division or the POI determines a proposed Adverse Weather Phenomena Reporting and Forecasting subsystem does not meet the requirements of this handbook, all submitted materials shall be returned to the operator with an explanatory letter. This letter must clearly state why the proposed subsystem was not approved. If at any time after a subsystem has been approved, the POI determines it does not continue to meet GACA requirements, the POI shall immediately inform the operator. If the operator does not take immediate and appropriate corrective action, the POI must take action to amend OpSpec A9 and rescind approval of the Adverse Weather Phenomena Reporting and Forecasting Subsystem.

**4.14.3.15. SPECIAL OPERATIONAL REQUIREMENTS.** Weather information systems must accommodate any special operational needs an operator may have because of the type of operations, the aircraft used in operations, or environmental conditions in the operating area.

**A. International Flight.** Transoceanic flight planning and other long range operations require precise navigational capabilities. The precision of the navigational capabilities is a direct result of careful preparation using the most current weather information available. Forecasts used for long range flight planning should include forecasts of winds and temperatures aloft for 500 mb, 300 mb, 250 mb, 200 mb, and 150 mb (as applicable), tropopause height information, and significant en route weather phenomena. This information should cover the intended flight operations with regard to time, altitude, and geography. SIGMET information should be provided regarding active or expected thunderstorms, widespread lines of cumulonimbus clouds, and cumulonimbus clouds embedded in cloud layers or concealed by haze. In addition to the weather information required for flight within the KSA, the following weather information is specifically required by ICAO procedures for international flight:

1) *At cruising levels below FL 450: Active thunderstorms:*

- Tropical cyclones
- Severe squall lines
- Hail
- Severe turbulence
- Severe icing

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- Mountain waves
- Standing lenticular clouds

2) *At cruising levels above FL 450:*

- Moderate or severe turbulence
- Cumulonimbus clouds
- Hail

**B. Rotorcraft Remote Site Operations.** Rotorcraft operations at remote sites may require special meteorological information. The extent of special weather information needed for a particular operation depends on the type of operation and the operating environment. High density altitudes, high winds, and icing conditions can be critical factors in rotorcraft operations, particularly when rotorcraft are required to hover out of ground effect or to make downwind or crosswind takeoffs or landings. In addition to weather information ordinarily required for rotorcraft operations, the following weather information is required for remote site operations:

1) *High elevation operating sites:*

- Mountain waves
- Low level windshear
- Strong surface winds (20 knots or greater)
- Moderate turbulence
- Surface temperature (for density altitude computations)

2) *Offshore operations:*

- Wave height
- Strong surface winds (20 knots or greater)

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- Fog conditions

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#### **CHAPTER 15. GROUND DEICING/ANTI-ICING PROGRAMS FOR PARTS 121, 125 AND 135**

##### **Section 1. General**

**4.15.1.1. BACKGROUND.** Section 1 of this chapter contains background information on ground-deicing/anti-icing of aircraft. Section 2 provides policy, direction, and guidance to General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) for evaluation and approval of operator procedures. Section 3 discusses infrared as a means of deicing/anti-icing aircraft. Section 4 provides procedures for evaluating an operator's deicing/anti-icing program. Volume 12, Chapter 2, Section 3, of this handbook covers ground-deicing/anti-icing surveillance procedures. There are essential differences in the ground-deicing/anti-icing requirements of the General Authority of Civil Aviation Regulations (GACAR) Parts 121, 125, and 135. For example, GACAR Part 121 requires operators intending to operate in ground icing conditions or to operate an aircraft any time conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft, to have a complete deicing/anti-icing program that includes the training and testing of all personnel involved in the ground-deicing/anti-icing process. GACAR Part 135 requires training and testing for pilots only. Additionally, if a GACAR Part 135 operator chooses to use personnel other than pilots to assist in the ground-deicing/anti-icing and verification process, then those individuals must receive adequate and appropriate training. GACAR Part 125 requires testing for pilots only; however, other personnel involved in the deicing/anti-icing process must receive adequate and appropriate training. GACAR Part 125 and 135 operators have the option to elect to meet the deicing/anti-icing requirements of GACAR § 121.1217(c) and institute a full deicing/anti-icing program. The Inspector should become thoroughly familiar with the differences and requirements in the GACARs covering operations in icing conditions.

**4.15.1.3. BASIC RULE.** GACAR § 91.197(b) prohibits a takeoff when frost, ice, or snow (contamination) is adhering to the wings, control surfaces, or propellers of an airplane. Traditionally, the pilot in command (PIC) is held responsible for ensuring that critical surfaces of the aircraft are free of adhering frozen contaminants before takeoff. Analyses of aviation accidents have shown that many PICs had not been provided with sufficient information to ensure that the aircraft was free of frost, ice, and snow. Subsequently, rules were amended to provide specific requirements for operating (that is, taking off) in weather conditions when frost, ice, or snow could reasonably be expected to adhere to the aircraft (here defined as ground-icing conditions).

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**4.15.1.5. PART 121 GROUND-DEICING/ANTI-ICING.** GACAR § 121.1213 prohibits takeoff when contamination is adhering to critical surfaces of an airplane or when takeoff would not be in compliance with § 121.1217. The exception to that general rule is that the GACA may approve takeoff with “frost under the wing in the area of the fuel tanks.” GACAR § 121.1217 requires a detailed, comprehensive, deicing/anti-icing program if an operator is going to operate “any time conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft” (ground-icing conditions).

**NOTE:** Principal operations inspectors (POI) may refer to Federal Aviation Administration (FAA) Advisory Circular (AC) 120-60 (as amended), Ground-deicing and Anti-icing Program.

### 4.15.1.7. DEFINITIONS.

**A. Pre-takeoff Check.** A pre-takeoff check is a check of the aircraft’s wings or representative aircraft surfaces for frost, ice, or snow within the aircraft’s hold over time. This check is required when the operator operates (that is, intends to takeoff) in ground-icing conditions, when the aircraft has been deiced/anti iced, and when a hold over time is established. This check is accomplished within the hold over time range, and is normally accomplished by the flight crew from inside the cockpit. The pre-takeoff check requires the flight crew to check the aircraft’s wings or representative aircraft surfaces for contamination as well as to assess the current weather or other situational conditions. The pre-takeoff check is integral to the use of hold over times. If holds over times are used, at least one pre-takeoff check must be performed.

**B. Pre-takeoff Contamination Check.**

- 1) A pre-takeoff contamination check is a check that the flight crew and ground personnel conduct after the hold over time has been exceeded to make sure that the wings, control surfaces, and other critical surfaces, as defined in the operator’s program, are free of frost, ice, and snow. The pre-takeoff contamination check must be completed within 5 minutes before beginning the takeoff. Operators must have-aircraft specific procedures for use by flight crew members and qualified ground personnel while conducting the check to ensure that the aircraft’s wings, control surfaces, and other critical surfaces remain free of frost, ice, or snow when a hold over time has been exceeded.
- 2) The pre-takeoff contamination check must be conducted from outside the aircraft for the following:

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- Hard-wing airplanes with aft, fuselage mounted, turbine-powered engines (examples: DC-9, MD-88, etc.)

**NOTE:** The check for these airplanes must include a tactile check of selected portions of the wing-leading edges and the upper wing surfaces. Alternatives to a tactile check may be approved only with concurrence of the Director, Flight Operations Division.

- For all other airplanes, unless the operator shows that the check can be adequately accomplished from inside the airplane. POIs may refer to FAA AC 120-60 for additional guidance.

**C. Hold Over Time.** Hold over time is the estimated time deicing/anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the treated surfaces of an aircraft. Hold over time begins when the final application of deicing/anti-icing fluid commences and expires when the deicing/anti-icing fluid applied to the aircraft loses its effectiveness.

**4.15.1.9. PART 121 GROUND-DEICING/ANTI-ICING PROGRAM.** In order for the operator to have an approved ground-deicing/anti-icing program that complies with GACAR § 121.1217, each operator's ground-deicing/anti-icing program must cover the following four areas:

- Management plan detailing operational responsibilities and procedures
- Hold over timetables and procedures for their use
- Procedures and responsibilities for aircraft ground-deicing/anti icing, pre-takeoff check and pre-takeoff contamination check procedures
- Initial and recurrent ground training and/or testing for flight crew members and qualification for all other affected personnel, as applicable

**4.15.1.11. MANAGEMENT PLAN.** The operator should develop, implement, and use a management plan to ensure proper execution of its approved deicing/anti-icing program. The management plan should include operations and maintenance responsibilities and identify the management positions that are responsible for ensuring that all necessary elements of the deicing/anti-icing program are properly executed.

### **4.15.1.13. HOLD OVER TIMETABLES AND THE PROCEDURES FOR THEIR USE.**

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**A. Hold over Timetables.** Each operator is required to develop, and have available, hold over timetables for use by its personnel. In addition, each operator must make its hold over timetables available for use in the cockpit. These timetables are required to be supported by data acceptable to the GACA. Currently, the only acceptable data is that developed by the Society of Automotive Engineers (SAE) and International Standards Organization (ISO). ARP 4737, “Aircraft Deicing/Anti-icing Methods with Fluids, for Large Transport Aircraft,” and ISO 11076, “Aerospace Aircraft Deicing/Anti-icing Methods with Fluids,” contain the tables that are currently considered acceptable for use by the operators to develop their timetables.

**NOTE:** POIs may refer to FAA AC 120-60 (as amended) for additional guidance regarding the development of procedures for increasing or decreasing determined hold over times.

**B. Takeoff Within a Hold over Time.** If takeoff is conducted within the hold over time, GACAR § 121.1217(c) requires at least one pre-takeoff check of the wings or representative surfaces to be completed by the flight crew within the hold over time range prior to the takeoff. Operators' manuals should contain detailed procedures regarding the use of the timetables in their operations. GACAR § 121.1217(c) requires that the operator's program contain procedures for the flight crew members to increase or decrease the determined hold over time in changing weather conditions.

**C. Takeoff After the Hold over Time Is Exceeded.** GACAR § 121.1217(c), takeoff after the hold over time is exceeded is permitted only if one or more of the following actions are taken:

- A pre-takeoff contamination check is made to ensure that wings, control surfaces, and other critical surfaces, as defined in the operator's program, are free of frost, ice, or snow
- It is otherwise determined by an alternative procedure, which was developed by the operator and approved by the GACA (for example, wing-icing sensors) that the wings, control surfaces, and other critical surfaces as defined in the operator's program, are free of frost, ice, or snow
- The wings, control surfaces, and other critical surfaces are re-deiced and a new hold over time has been established

### 4.15.1.15. PART 135 GROUND-DEICING/ANTI-ICING.

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**A. General.** GACAR § 135.691(a) prohibits a pilot from taking off in an aircraft that has “frost, ice, or snow adhering to any rotor blade, propeller, windshield, wing, stabilizing or control surface, to a powerplant installation, or to an airspeed, altimeter, rate of climb, or flight attitude instrument system...” As evident by the use of the term rotor blade, rotorcrafts are subject to the regulation. There is one exception to the regulation:

**B. Operator Who Does Not Operate in Ground-icing Conditions.** The Part 135 ground-deicing rule does not apply to an operator who does not operate in ground-icing conditions. Under the regulation, ground-icing conditions exist any time weather conditions are such that frost, ice, or snow may reasonably be expected to adhere to the airplane. The operator who does not operate in ground-icing conditions is not required to train its pilots or develop pre-takeoff contamination procedures. Operators who do not operate in ground-icing conditions must be issued OpSpec A42.

**C. Operators Who Use Only One Pilot in Their Operations.** Operators who use only one pilot in their operations (single-pilot operator) are not required to comply with the manual and approved training requirements of GACAR § 135.401. Therefore, single-pilot operators are not required to have an approved pilot training program nor the additional training required by the Part 135 ground-deicing rule. However, single-pilot operators must comply with all the operational requirements of the Part 135 ground-deicing rule. Those operational requirements include a pre-takeoff contamination check or an approved alternative procedure to the pre-takeoff contamination check described in its OpSpecs. The pilots of these types of operators need to demonstrate knowledge to operate in ground-icing conditions during the initial and recurrent flight checks. A single-pilot operator should have an aircraft specific description of the pre-takeoff contamination check in OpSpec A23 or A41, as applicable. If the operator does not operate in ground-icing conditions, OpSpec A42 must be so documented and issued.

**D. Rotorcraft Operations.** Rotorcraft operations conducted under Part 135 are excluded from the additional training and pre-takeoff contamination check requirements of the Part 135 ground-deicing rule. However, the regulation requires rotorcraft operations to be conducted in accordance with the applicable operating limitations.

**4.15.1.17. SOURCES OF INFORMATION.** The following publications may be useful to Inspectors and operators for developing, reviewing, and approving a ground-deicing/anti-icing program.

### **A. FAA AC 20-117, Hazards Following Ground-deicing and Operations in Conditions**

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**Conducive to Aircraft Icing.** This AC contains useful background information and also contains an extensive bibliography of related FAA and private sector publications, training materials, and other deicing/anti-icing or related information. See FAA Advisory Circular AC 20-117 (as amended).

### B. Publications of the SAE:

- AMS 1424, “Deicing/Anti-icing Fluid, Aircraft, Newtonian SAE Type I”
- AMS 1428, “Fluid, Aircraft Deicing/Anti Icing, Non Newtonian, Pseudoplastic, SAE Type II”

**C. SAE ARP4737.** This publication of the SAE contains hold over tables and information on how they are developed as well as information on the inspection of aircraft.

### D. ISO Publications:

- ISO 11075, “Aerospace Aircraft Deicing/Anti-icing Newtonian Fluids ISO Type I”
- ISO 11076, “Aerospace Aircraft Deicing/Anti-icing Methods with Fluids”
- ISO 11077, “Aerospace Deicing/Anti-icing Self Propelled Vehicles Functional Requirements”
- ISO 11078, “Aerospace Aircraft Deicing/Anti-icing Non Newtonian Fluids ISO Type II”

**E. FAA AC 120-60 (as amended), Ground-deicing and Anti-icing Program.** This AC contains information on how operators may develop acceptable ground-deicing/anti-icing programs.

**F. FAA AC 135-16 (as amended), Ground-deicing & Anti-icing Training & Checking.** This AC contains information on how operators may develop acceptable ground-deicing/anti-icing programs.

**G. FAA AC 120-58 (as amended), Pilot Guide Large Aircraft Ground-deicing.**

**H. Winter Operations Guidance for Air Operators.** The following list contains a number of publications that may be useful as a resource on the deicing/anti-icing of aircraft. Specific

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publications are listed here in case they need to be obtained and used separately:

- FAA AC 91-13, Cold Weather Operation of Aircraft
- FAA AC 65-9A, Cold Weather Suggestions (see Chapter 11)
- FAA AC 65-15A, Deicing/Anti-icing Systems of Aircraft (see Chapter 7)
- FAA AC 20-73, Operational Factors
- FAA AC 135-9, Title 14 CFR Part 135 Icing Limitations

**NOTE:** Numerous video tapes have been produced by manufacturers of deicing/anti-icing products and by aircraft operators. Access to these tapes may be available through the manufacturers of these products or aircraft.

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**CHAPTER 15. GROUND DEICING/ANTI-ICING PROGRAMS FOR PARTS 121, 125 AND 135**

**Section 2. Approval of Procedures for Parts 121, 125, and 135**

**4.15.2.1. GACA ACTIVITY REPORT (GAR).**

A. 1637 (OP)

**4.15.2.3. GENERAL.** This section contains policy, direction, and guidance for aviation safety inspectors (Inspectors), for review, evaluation and approval of deicing/anti-icing procedures. The requirements for operations in ground-icing conditions are covered in General Authority of Civil Aviation Regulation (GACAR) §§ 121.1217, 125.465 and 135.671.

**A. Part 121 Regulatory Requirements.** GACAR § 121.1217 requires that an operator conducting operations when conditions are such that frost, ice, or snow may reasonably be expected to adhere to the aircraft must have and use an approved aircraft ground-deicing/anti-icing program in accordance with GACAR § 121.1217.

**B. Part 125 Regulatory Requirements.** Part 125 operators are required to comply with the operating limitations of GACAR § 125.465 and the testing requirements of GACAR § 125.349(a)(9) and one of the following:

- 1) A pre-takeoff contamination check, that has been established by the operator and approved by the President for the specific aircraft type, has been completed within 5 minutes before takeoff. A pre-takeoff contamination check is a check to make sure the wings and control surfaces are free of frost, ice, or snow.
- 2) The operator has an approved alternative procedure, and under that procedure the aircraft is determined to be free of frost, ice, or snow.
- 3) The operator has an approved deicing/anti-icing program that complies with GACAR § 121.1217, and the takeoff complies with that program.

**C. Part 135 Regulatory Requirements.** GACAR § 135.671 require pilot training in accordance

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with GACAR § 135.401 if an operator is going to operate (that is, takeoff) “any time conditions are such that frost, ice, or snow may reasonably be expected to adhere to the airplane...” (ground icing conditions). Therefore, if the operator is operating in ground-icing conditions, it must have one of the following:

- 1) A pre-takeoff contamination check, that has been established by the operator and approved by the President for the specific aircraft type, has been completed within 5 minutes prior to beginning takeoff. A pre-takeoff contamination check is a check to make sure the wings and control surfaces are free of frost, ice, or snow.
- 2) The operator has an approved alternative procedure and under that procedure, the aircraft is determined to be free of frost, ice, or snow.
- 3) The operator has an approved deicing/anti-icing program that complies with GACAR § 121.1217 and the takeoff complies with that program.

### 4.15.2.5. APPROVAL PROCESS.

**A. Part 121 Operators.** The approval of an operator’s required ground-deicing/anti-icing program follows the five step general process for approval and acceptance outlined in eBook Volume 1, Chapter 4, Section 1.

**B. Part 125 Operators.** The use of the following process for Part 125 operators would be helpful, but is not required unless the operator elects to develop a deicing/anti-icing program in accordance with GACAR § 121.1217. However, Operation Specification (OpSpec) A23 should be issued to clarify the approved deicing/anti-icing program for each Part 125 operator.

**C. Part 135 Operators.** Part 135 deicing/anti-icing requirements are fulfilled through the completion of approved deicing/anti-icing training and by the issuance of OpSpec A23. If applicable, OpSpec A41 must describe or reference pre-takeoff contamination check procedures for each specific airplane type. These procedures must also be contained in the operator’s Operations Manual (OM).

**D. Five Step Approval Process.** Should a GACAR Part 125 or 135 operator elect to develop a deicing/anti-icing program in accordance with GACAR § 121.1217, the following standard approval process would apply. For purposes of clarity and description, the five stage process is described in this section as five separate and distinct stages. In practice, the stages may overlap,

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and Inspectors should consult with the Director, Flight Operations Division before varying the process to fit the circumstances.

**E. Evaluation of Operator's Program.** The approval process requires the evaluation of the operator's program by a team of Inspectors, which is composed of the principal operations inspector (POI), the principal maintenance inspector (PMI), and as needed, aviation safety inspectors (Inspectors) of both operations and airworthiness specialties working under their leadership. The advent of icing sensors, which offer an alternative means of determining that the aircraft is free of frost, ice, and snow, may necessitate a need for additional resources for the evaluation.

**F. Issuance of OpSpecs.** At the successful conclusion of the process, the operator is issued OpSpecs that authorize the operator to conduct operations under the program when conditions exist such that frost, ice, or snow may reasonably be expected to adhere to the operator's aircraft.

**4.15.2.7. PHASE ONE-INITIAL DISCUSSION.** Phase One begins when the operator initially approaches the General Authority of Civil Aviation (GACA) to obtain approval of a ground-deicing/anti-icing program.

**A. Become Familiar with Technical Problems and Regulatory Requirements.** At this stage, both the Inspector and the operator must become familiar with the technical problems involved and the regulatory requirements. Section 1 of this chapter includes a listing of additional resource documents the operator may find useful in developing a program. Inspectors should ensure that the operator is aware of these sources of information.

**B. Outline Required Elements.** The Inspectors should outline for the operator those elements that must be contained in the operator's proposed program and the actions that are required at each stage of the approval process (see Section 1 of this Chapter).

**4.15.2.9. PHASE TWO-INITIAL OPERATOR SUBMISSION.** Phase Two begins when the operator initially submits a proposed program package. The Inspectors' first action is to review the operator's submission to determine if each element specified in phase one is included. If the operator's initial program is incomplete, the Inspector must immediately inform the operator and determine what action the operator proposes to take to complete the package. If the operator's package is complete or the Inspector determines that it will soon be complete, the Inspector should distribute the elements to the appropriate inspector team for a prompt initial examination. Inspector should return obviously unacceptable packages to the operator with a letter outlining the

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deficiencies.

**A. Initial Examination.** The initial examination does not include a detailed operational or technical evaluation (this analysis is conducted in Phase Three). The Phase Two examination is conducted in sufficient detail to assess the completeness of the operator's package. Inspectors assigned to complete the initial review should promptly complete the initial evaluation and their findings.

**B. Unacceptable Elements.** At this point, it is appropriate for the Inspector to hold a meeting with the operator to discuss any obviously unacceptable elements of the program. Under unusual circumstances, the Inspector may need to return the operator's entire package with a written statement that explains why the submission is unacceptable.

**C. Initially Acceptable Package.** When the operator's package is initially acceptable, the Inspector should inform the operator and provide an estimate of when the operator can expect to be informed of the phase three analysis results.

**4.15.2.11. PHASE THREE-PRELIMINARY APPROVAL.** Phase Three consists of a detailed analysis of the operator's ground-deicing/anti-icing program, training, equipment, and facilities. Throughout Phase Three, Inspectors and operators should expect to encounter various deficiencies. Inspectors and operators should plan to meet and work closely to agree on corrections for these deficiencies throughout phase three.

**A. Document Review.** The first step in phase three is a detailed review and analysis of those manual sections the operator has prepared for the ground-deicing/anti-icing program.

1) See Volume 4, Chapter 12 for general guidance on review and acceptance of operator manuals, procedures, and checklists. Inspectors should ensure that the content of the operator's manual meets the following criteria:

- Identifies clearly each category of employee with responsibility for program elements
- Defines the duties of each category of employee involved
- Provides adequate background information, step-by-step procedures and, when appropriate, checklists that allow each category of employee to perform to the required standard

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**NOTE:** The most critical area of an operator's ground-deicing/anti-icing program is an adequate pre-takeoff contamination check. It is essential for the Inspector to ensure that the operator's procedures offer the means for personnel to adequately determine that the aircraft is free of contamination before a takeoff during conditions when frost, ice, or snow may reasonably be expected to adhere to the aircraft. This becomes more critical if the Inspector authorizes the pre-takeoff contamination check to be conducted from inside the airplane (OpSpec A41).

**B. Training Program Review.** GACAR § 121.1217 addresses the initial and recurrent training requirements for all operators (GACAR Part 121, 125 and 135).

- 1) The training must include both general procedures and the specific requirements of each make, model, series, and variant of aircraft.
- 2) The training program must include a means of testing and qualification for each category of employee who is covered under the approved program and who checks, inspects, deices, anti-ices, releases, dispatches, or operates an aircraft.
- 3) The operator's training program must include flight crew and dispatcher training, as applicable.

**C. Facilities and Equipment.** The operator must acquire and deploy the equipment to accomplish ground-deicing/anti icing. Inspectors should plan to inspect some or all of the facilities at which this equipment is deployed (depending on the size of the operator) before granting initial approval. Some operators fulfill part of this requirement by demonstrating the knowledge of procedures and equipment during non-icing conditions prior to the deicing/anti-icing season. Inspectors must also evaluate coordination procedures between the aerodrome operator and the air traffic service (ATS) facility at the aerodrome.

**D. OpSpecs for Operators with Ground-deicing/Anti-icing Program Approval.** When the POI and PMI are satisfied that the operator is able to begin ground-deicing/anti-icing operations, they should issue OpSpec A23. The OpSpecs should reference the sections of the operator's manual that contain the operations and airworthiness portions of the operator's program. If an operator has an approved pre-contamination check or alternative procedure, then OpSpec A41 will be issued.

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### 4.15.2.13. PHASE FOUR-VALIDATION TESTING.

Phase four consists of a validation of the

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operator's procedures in actual operations. This process consists of a progressive refinement of the operator's manuals, checklists, and procedures as experience is gained and GACA surveillance reports become available.

**A. Reason for Surveillance.** Surveillance of the operators' ground-deicing/anti-icing programs or procedures is necessary to evaluate the effectiveness of these programs as well as to provide input on the adequacy of the rule requirements. Surveillance will further identify problem areas and will facilitate corrective action.

- 1) *Responsibilities.* Inspectors should be familiar with the aerodrome deicing/anti-icing plans and the ground-deicing/anti-icing programs and procedures of the operator.
- 2) *Conduct of Inspections.* The only time that it may be possible to determine that the operator's ground-deicing/anti-icing procedures are safe and effective is during actual icing conditions. Therefore, inspection of operator ground-deicing/anti-icing procedures should be conducted during the times that winter operations and operators' ground-deicing/anti-icing procedures are in effect. Inspector surveillance is a sampling process. It is not intended to observe every deicing operation that occurs during the time that ground-deicing/anti-icing operations are ongoing. Through effective sampling, the GACA should be able to determine the operator's ability to comply with the ground-deicing regulations and meet the requirements of their OpSpecs. The required number of ground-deicing surveillance activities necessary to determine a particular operator's effectiveness may vary from a relatively low percentage to a very high percentage. For certain operators, 100 percent surveillance may be necessary in order to determine the operator's capability to safely operate during ground-icing conditions.
  - a) Inspections can be conducted in conjunction with ramp or en route inspections, or during aerodrome site visits.
  - b) Surveillance of operators' recurrent ground-deicing/anti-icing testing or training programs should also be conducted.
  - c) The POI should coordinate an inspection of the ground-deicing/anti-icing equipment used by the operator, with Inspectors who are responsible for aerodromes where the equipment is located. In some cases, one operator or contractor may deice more than one air operator. In this case, it is necessary for the POI to ensure that the operator/contractor doing the deicing has a complete knowledge of the specific

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operator's approved ground-deicing/anti-icing program. The POI can conduct this type of surveillance prior to the deicing/anti-icing season and should confirm that the company performing the deicing has knowledge and ability regarding ground-deicing/anti-icing equipment.

3) GACA Activity Report (GAR). An Operations Inspector should record surveillance of ground-deicing/anti-icing operations by using GAR 1637 (OP).

**B. Conclusion of Phase Four.** Phase Four may be concluded when, in the judgment of the POI and PMI, surveillance of the operator's program shows that the operator is successfully conducting the program under actual ground-icing conditions. There is no minimum time period for phase four, but the Inspectors must have an adequate number of surveillance reports to form an educated opinion of the operator's performance. This may be difficult in the Kingdom of Saudi Arabia (KSA) environment; however, operators should normally be able to progress through Phase Four in one winter season or less.

**C. Deficiencies.** If final approval cannot be granted after an entire winter season due to deficiencies in the operator's program, the POI and PMI should consider having the operator return to Phase Two. An Inspector shall revise the OpSpecs of operators who are returned to Phase Two.

**4.15.2.15. PHASE FIVE-FINAL APPROVAL.** When the Inspectors are satisfied with the operator's performance, they should inform the operator in writing that the verification process is complete and ensure that all applicable OpSpecs are issued.

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## VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION

### CHAPTER 15. GROUND DEICING/ANTI-ICING PROGRAMS FOR PARTS 121, 125 AND 135

#### Section 3. Other Means of Deicing/Anti-Icing

##### 4.15.3.1. GROUND DEICING USING INFRARED (IR) ENERGY.

**A. Background.** Given the cost of deicing with conventional fluids and the recent demand for alternative deicing methods, interest in Infrared (IR) deicing systems has increased. IR energy has been used by the industrial and domestic heating industry for several decades. Studies have shown that, when used properly, IR energy has no harmful effects on humans or animals. Tests conducted by the Federal Aviation Administration (FAA) have also demonstrated that IR energy does not pass through the aircraft surfaces and has a negligible effect on cabin internal temperature. The General Authority of Civil Aviation (GACA) encourages the development and use of alternative methods of deicing such as IR systems. However, as with all deicing equipment, it is necessary to ensure that IR deicing systems are used with the highest degree of competence and safety.

##### B. Related Documents.

1) *Federal Aviation Administration (FAA) Publications.*

- FAA AC 120-89 (as amended), Ground Deicing Using Infrared Energy, as amended.
- FAA AC 120-60, Ground Deicing and Anti-icing Programs (as amended)
- FAA AC 150/5300-14 (as amended), Design of Aircraft Deicing Facilities, Change 2.

2) *Publications of the Society of Automotive Engineers (SAE).* Copies of the following documents may be obtained by writing to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA, 15096-0001.

- Aerospace Recommended Practice (ARP) 4737, Aircraft Deicing/Anti-icing Methods
- Aerospace Recommended Practices (ARP) 5149, Training Program Guidelines for

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### Deicing/Anti-icing of Aircraft on Ground

#### C. Use of IR Systems.

1) *IR Emitter Units.* IR energy can be produced in a number of ways. The method most commonly used for deicing is a gas-fired IR system. This system uses gas-fired units suspended from the ceiling of the modular shelter facility. These units are controlled by an on-site operator located at a control station within the facility. The system can be instantly turned off using emergency shutdown buttons located either at the control station or around the facility.

2) *How an IR system Deices Aircraft.*

a) *Critical Aircraft Surfaces.* Unlike heated hangars where convection heat energy is generally distributed, IR energy does not heat the air that it passes through. The energy is concentrated on specific areas. When deicing, the IR emitter units impart sufficient IR focused energy on the aircraft surfaces in line-of-sight of the IR units to melt the frozen contaminants on those surfaces.

b) *Aircraft Underbody.* If the energy does not reach the underbody of the aircraft, including the landing gear, ice could be retained at these locations even though the upper parts of the aircraft are free of ice contamination. In situations where the underbody is clean it could be possible, under certain conditions, for water to refreeze on parts of the underbody as it runs off of the wing and other upper portions of the aircraft. However, heat always seeks a balance with surrounding areas and always moves from the warmer medium to the cooler medium. In-service experience has demonstrated that some of the heat energy reflected by the facility structure, in addition to the heat energy which is absorbed by the ground before the aircraft arrives, will re-radiate to the colder under-wing and landing gear surfaces to remove frozen contamination. As with all deicing methods, the air operator is responsible for performing a post-deicing inspection of these areas to ensure that all frozen contamination has been removed.

3) *Size of IR Deicing Facilities.* These systems are used to deice commuter and moderate-sized (e.g., B-757) aircraft. Systems capable of deicing large aircraft (e.g., B-747) may also be available.

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4) *Use of Deicing Fluid with IR Systems.* Deicing fluid can be used in conjunction with IR energy in cases where water refreezes on part of the airplane not exposed to IR energy.

5) *Responsibilities of Flight crews.* As with all deicing methods, when an aircraft is deiced using an IR facility, it remains the responsibility of flight crews to assure that all contamination has been removed from the aircraft and that no further contamination is likely to occur before takeoff.

6) *Deicing and Anti-icing.* An IR system is used to deice an aircraft. An IR system does not function as an anti-icing agent. No Holdover Times (HOT) exist for IR energy. Anti-icing fluids may be used in conjunction with an IR system, after an aircraft has been deiced, if the aircraft is expected to operate in active ground icing conditions. If contamination is likely to occur after IR deicing and the facility includes the application of an anti icing freezing point depressant (FPD), the IR facility operator's use of the FPD must comply with the requirements of General Authority of Civil Aviation Regulation (GACAR) § 121.1217.

**D. Approval Criteria.** The GACA does not certificate IR deicing facilities. Therefore, an operator who wishes to use an IR facility should confirm that the IR facility meets the criteria of FAA AC 120-89, Ground Deicing Using Infrared Energy, or provide an alternative means acceptable to the GACA of assuring the operational safety of the deicing facility, with supporting documentation, before including that IR facility in its program/plan. Using IR energy to deice airplanes can be part of any operator's deicing/anti-icing program/plan regardless of whether the operator is operating under GACAR Part 121, 125 or 135.

1) Along with the guidance in Section 2 of this Chapter, principal operations inspectors (POIs) should consider the follow criteria before approving the use of an IR facility as part of an operator's ground deicing program. The operator must show the POI that the IR facility addresses these criteria.

- a) The IR facility operator should provide an appropriate description of the system (hardware, energy source, markings, etc.).
- b) The IR deicing system should perform its intended purpose, i.e., it must be capable of effectively deicing an aircraft.
- c) The IR deicing systems should not create a hazard to:

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1. Aircraft.
2. Ground personnel.
3. Crew members.
4. Passengers.
5. Cargo.
6. Aerodrome facilities.

- IR energy has no effect on navigational aids, antennas, communication facilities, and building as it is in a different area of the electromagnetic spectrum. However, the systems location (as with any aerodrome structure) should be approved with regards to tower sightlines and runway obstacle free areas, etc. This is normally accomplished by the local aerodrome authority in their applications to the GACA
- IR aircraft ground deicing facilities should be designed to operate with the IR energy source positioned at least ten feet away from the aircraft surface

- d) To be approved, any IR system should be in general agreement with appropriate industry standards, as created by groups such as the Society of Automotive Engineers (SAE) and the International Standards Organization (ISO), and should conform to applicable GACA requirements.
- e) Any process for approving the operational use of an IR system should follow established guidelines set by industry groups, such as SAE, ISO, Air Transport Association (ATA), International Civil Aviation Organization (ICAO), and the General Aviation Manufacturing Association (GAMA). These guidelines should address:

- The training of flight crew, IR equipment ground operator personnel, facility maintenance personnel, and anti-icing ground personnel
- Melted ice flowing into aerodynamically quiet areas and refreezing (SAE ARP4737).

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- Additional deicing and anti-icing requirements
  - Environmental considerations
- f) Notification must be obtained from the aircraft manufacturer that the IR energy can safely be used on composite aircraft surfaces.
- 2) Once an operator has determined that the IR deicing system to be used by a deicing facility meets these criteria, the operator should present its findings to the POI for review. Once the POI determines from the findings presented that the IR deicing system meets all criteria, the system may become part of the operator's deicing/anti-icing program.

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### VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION

#### CHAPTER 15. GROUND DEICING/ANTI-ICING PROGRAMS FOR PARTS 121, 125 AND 135

##### Section 4. Airworthiness Evaluation of an Operator's Deicing/Anti-Icing Program

###### 4.15.4.1. GACA ACTIVITY REPORT (GAR).

A. 3625 (AW)

**4.15.4.3. OBJECTIVE.** This section provides guidance for the principal maintenance inspector (PMI) in assisting the principal operations inspector (POI) in evaluating proposed deicing/anti-icing programs.

**4.15.4.5. GENERAL.** The current regulations in General Authority of Civil Aviation Regulation (GACAR) Parts 121, 125, and 135 are based on the “clean aircraft” concept. These regulations prohibit a takeoff with frost, ice, or snow (contamination) adhering to the wings, control surfaces, or propellers of an airplane. GACAR §§ 121.1217, 125.465 and 135.671 require that each operator who conducts operations under conditions that may produce frost, snow, or ice accumulation must have one or both of the following:

- An approved aircraft deicing program
- An inspection program that ensures that aircraft are free of any accumulation of frost/ice/snow before takeoff

**A. Approval Process.** The approval of an operator's deicing/anti-icing program involves the following steps:

1) *Reviewing the Operator's Program Submission.* Both the PMI and the POI initially review the proposed program to ensure that all required elements are submitted. After the PMI and the POI are satisfied that all of the required elements are suitably addressed, they should distribute copies of the program to all aviation safety inspectors (Inspectors) involved with that operator.

2) *Evaluating the Operator's Program Submission.* Conduct a detailed analysis of the

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proposed program, training, equipment, and facilities.

3) *Validation Testing.* Validate the operator's performance during actual operations.

**B. Issuance of Operations Specifications (OpSpecs).** At the conclusion of the process, the POI will approve the issuance of the appropriate OpSpecs to that operator. The OpSpecs authorize the operator to conduct operations under the approved program in ground icing conditions in which frost, ice, or snow may reasonably be expected to adhere to the operator's aircraft.

### **4.15.4.9. PREREQUISITES AND COORDINATION REQUIREMENTS.**

#### **A. Prerequisites.**

- Knowledge of the regulatory requirements of GACAR Parts 91, 121, 125, or 135, as applicable

**B. Coordination.** This task requires coordination with POIs and the operator.

### **4.15.4.11. REFERENCES, FORMS, AND JOB AIDS.**

**A. References.** Although not all-inclusive, the references in the following list can provide valuable information to Inspectors on this subject:

- FAA Advisory Circular (AC) 20-73, Aircraft Ice Protection
- FAA AC 20-117, Hazards Following Ground Deicing and Ground Operations in Conditions Conducive to Aircraft Icing
- FAA AC 65-9, Airframe and Powerplant Mechanics General Handbook (see Chapter 11)
- FAA AC 65-15, Airframe and Powerplant Mechanics Airframe Handbook (see Chapter 7)
- FAA AC 91-6, Water, Slush, and Snow on the Runway
- FAA AC 91-13, Cold Weather Operation of Aircraft
- FAA AC 120-58, Pilot Guide for Large Aircraft Ground Deicing

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- FAA AC 120-60, Ground Deicing and Anti-Icing Program
- FAA AC 120-89, Ground Deicing Using Infrared Energy
- FAA AC 135-9, 14 CFR Part 135 Icing Limitations
- FAA AC 135-16, Ground Deicing and Anti-Icing Training and Checking
- FAA AC 135 17, Pilot Guide - Small Aircraft Ground Deicing
- Aerospace Material Specifications (AMS) 1424, Deicing/Anti Icing Fluid, Aircraft, SAE Type I
- AMS 1428, Fluid, Aircraft Deicing/Anti-Icing Non Newtonian, (Pseudo Plastic), SAE Types II, III, and IV
- Aerospace Recommended Practices (ARP) 4737, Aircraft Deicing/Anti icing Methods
- ARP 5149, Training Program Guidelines for Icing/Anti-Icing of Aircraft on Ground
- FAA-P-8740-24, General Aviation Accident Prevention Program, Tips on Winter Flying
- FAA Order 8000.9x, Volume 4, Chapter 3, Section 5, Selected Practices
- ISO 11075, Aerospace—Aircraft Deicing/ Anti-Icing Newtonian Fluids ISO type I
- ISO 11076, Aerospace—Aircraft Deicing/ Anti-Icing Methods with Fluids
- ISO 11077, Aerospace—Self Propelled Deicing/Anti-Icing Vehicles Functional Requirements
- ISO 11078, Aerospace—Aircraft Deicing/Anti-Icing Non Newtonian Fluids, ISO Type II
- Publications of the Association of European Airlines (AEA) found on the Web site:  
[http://wwwaea.be/AEAWebsite/Presentation\\_Tier/Pr\\_Home.aspx](http://wwwaea.be/AEAWebsite/Presentation_Tier/Pr_Home.aspx)

**NOTE:** Numerous videos have been produced by manufacturers of deicing/anti-icing products and by aircraft operators. Access to these videos may be available through the

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regional deicing/anti-icing coordinator.

**B. Forms.** GACA Activity Report (GAR).

**C. Job Aids.** None.

### **4.15.4.13. PROCEDURES.**

**A. Brief the Operator.**

- 1) Assist the operator in acquiring all of the pertinent published information.
- 2) Ensure that the operator is familiar with the technical difficulties that may be involved and the regulatory requirements that must be met.
- 3) Outline for the operator those elements that must be contained in the operator's proposed program and the required actions at each stage of the approval process.
- 4) POIs and PMIs should inform the operators for which they have oversight responsibility of the process and criteria for approving infrared deicing systems. The operators must be aware that it is their responsibility and not the GACA's to evaluate any infrared deicing system that they wish to use for their aircraft ground deicing/anti-icing program.

**B. Review the Operator's Submittal .**

- 1) If the submission is incomplete, immediately inform the operator and determine if the operator intends to complete the package.
- 2) If the submission is complete, inform the operator and distribute the documents to the appropriate inspectors for initial examination.
- 3) If the package is unacceptable, discuss with the operator those elements that were unacceptable and/or return the package with a letter outlining the deficiencies.
- 4) Once an operator has determined that an infrared deicing system meets the criteria, that operator should present the findings of their evaluation to their principal inspector.

**C. Evaluate the Operator's Deicing/Anti-icing Program .**

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- 1) Ensure that the manual provides all categories of employees with instructions and information that helps them to perform their duties with a high degree of safety.
- 2) Ensure that the operator's manual material includes the following:
  - a) Clear identification of each category of employee with responsibility for deicing/anti-icing program elements;
  - b) Duty definition of each category of employee involved;
  - c) Background information and step-by-step procedures; and
  - d) Checklists, where appropriate, that allow each category of employee to perform their responsibilities to the required standard.
- 3) In order to ensure that the program complies with GACAR § 121.1217 each operator's ground deicing/anti-icing program must cover a management plan detailing operational responsibilities and procedures as described in FAA AC 120-60.

**D. Review Management Plan.** The operator should develop, implement, and use a management plan to ensure proper execution of its approved deicing/anti-icing program. The management plan should include operations and maintenance responsibilities and identify the management positions that are responsible for ensuring that all necessary elements of the deicing/anti-icing program are properly executed.

**E. Examine Holdover Timetables And The Procedures For Their Use.** Ensure that each operator has developed, and has available, holdover timetables for use by its personnel. In addition, each operator must make its holdover timetables available for use in the cockpit. These timetables are required to be supported by data acceptable to the GACA.

**F. Evaluate the Operator's Training .** Ensure that the operator has developed a training program that qualifies each category of employee with responsibilities for deicing/anti-icing. Flight crew training must be incorporated into the operator's approved training program. The training program must include the following:

- 1) General procedures and any specific requirements for each make, model, and variant of aircraft used by the operator;

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- 2) Means of testing, qualification, and requalification for each category of employee involved in the program;
- 3) Demonstration of proficiency, by performance, of flight crew members, equipment operators, and inspectors; and
- 4) Procedures for recurrent training.

### **4.15.4.15. TASK OUTCOMES.**

**A. Complete the GAR.**

**B. Complete the Task.** Completion of this task results in the following:

- For program approval, the issuance of OpSpecs.

**C. Document the Task.** File all of the supporting paperwork in the GACA office file for the operator.

### **4.15.4.17. FUTURE ACTIVITIES.** Normal surveillance.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 16. LEASE AGREEMENTS FOR PARTS 121 AND 135**

##### **Section 1. Introduction to Aircraft Leasing**

###### **4.16.1.1. BACKGROUND.**

**A.** In recent years, the practice of leasing aircraft has come into wide usage. Many leases involve aircraft owned by individuals or companies that are registered in one State and leased to operators from another State.

**B.** There are a number of different types of leases, which may be short term or long term. All the various aspects need to be addressed by the responsible authorities. Lease arrangements may also be known as, charter, or sub-charter. There may also be cascading sub-leases. Other aspects of cooperation between operators, either nationally or internationally, include code-sharing, franchising or interchange.

**C.** Unless suitable arrangements are made between the States involved, a lease may create complex legal, safety, enforcement, and practical problems for either the State of Registry of the aircraft, for the State of the Operator, or for both of these States. These problems arise because of possible uncertainty concerning which party is responsible for the safe operation and for the airworthiness of the aircraft and uncertainty concerning the regulations of which State are applicable. The responsible authorities must resolve such uncertainties before a lease takes effect. The determination of responsibilities is a factual issue that depends upon the terms of the lease or other agreements. Determining which party to a lease is responsible for the operational control and airworthiness will in turn clarify the regulations of which State will apply, and what oversight responsibilities a particular State has for the operation of a leased aircraft. In some instances, the oversight responsibilities of the State of Registry and the State of the Operator may overlap.

**D.** Problems associated with leasing have become more widespread because a considerable number of lessors have entered the leasing market. These include:

- Companies formed for the specific purpose of purchasing and leasing aircraft
  - Commercial banks and other financial institutions
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- Aircraft manufacturers
- Airline companies

**E.** In many States, national regulations charge the competent authority, the Civil Aviation Authority (CAA), with the responsibility for ensuring that every aircraft on its registry complies with the detailed technical and safety regulations promulgated by that State, wherever such aircraft may be operated. Practical problems arise because the aviation authorities in some States do not have sufficient personnel or funding resources to properly carry out their regulatory responsibilities, particularly in international commercial air transport. These responsibilities include ensuring that every aircraft on their registry, including those leased to an operator conducting flights under the authority of another State, are operated in compliance with the regulations of the State of Registry. These responsibilities in turn create serious surveillance and enforcement problems for the State of Registry because these leased aircraft are frequently operated in distant areas where CAA personnel from the State of Registry would find it difficult to conduct safety inspections. Compliance with the pertinent safety standards and regulations of the State of Registry may therefore diminish. Violations of regulations may occur by design or from ignorance and be unknown to the State of Registry. As a result, it is unlikely that enforcement action would be taken with respect to such leased aircraft.

**F.** Problems inherent in aircraft leasing were not anticipated when the Convention on International Civil Aviation was formulated by the International Civil Aviation Organization (ICAO). It was assumed that operators would normally own the aircraft they operated and that the nationality of an aircraft would normally be that of the operator i.e. that the State of Registry and the State of the Operator would be one and the same. As a result, the Convention specifies in a number of respects that the fundamental responsibility for an aircraft lies with the State of Registry. The various responsibilities of the State of Registry are further expanded in the Annexes to the Convention.

**G.** ICAO recognized that a State of Registry may be unable to fulfill its responsibilities adequately when aircraft are leased or chartered, particularly without crew, by an operator from another State. A note was therefore added to ICAO Annex 6 and to ten other Annexes, suggesting that the State of Registry delegate to the State of the Operator, subject to the acceptance by the latter State; those functions of the State of Registry that can more adequately be discharged by the State of the Operator. It was recognized, however, that such a delegation would only be a matter of practical arrangement by which the State of Registry would discharge

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certain functions, which had been allocated by the Convention, through an agent to the State of the Operator. Hence, the means suggested by these notes does not totally relieve the State of Registry from its obligations under the Convention. These delegations are accomplished with agreements between States in accordance with Article 83bis of the ICAO Convention. Further information on this subject is contained in Section 4 of this Chapter.

**H.** Nevertheless, where aircraft were leased to operators in certain States willing to accept the responsibility, this arrangement provided for a partially acceptable interim solution because the State of Registry could delegate some of its responsibilities under the Convention to the State of the Operator. Such an arrangement, however, did not in all cases absolve the State of Registry from its responsibilities under its own national regulations for aircraft on its registry. The problem was more acute when an aircraft registered in one State was leased, under a dry lease, to an operator in another State, where that State was unwilling, or unable, to accept delegation of responsibility from the State of Registry. Additionally, the leasing problems become even more severe where the safety standards of the State concerned may not be acceptable to the State of Registry, or to the lessor, or where the State of the Operator does not have the capability of properly administering, and enforcing, existing safety regulations. Under such circumstances the potential lessor may be reluctant to lease an aircraft to an operator from the other State or, if a lease was executed, the State of Registry could be considered negligent if it consented to delegating its responsibilities to such a State.

### 4.16.1.3. DEFINITIONS.

**A. Lease.** A contractual arrangement whereby a certificated air operator gains or gives use of an aircraft without transfer of ownership.

**B. Lessee.** The party to which the aircraft is leased.

**C. Lessor.** The party from which the aircraft is leased.

**D. Dry Lease.** Any leasing arrangement when the aircraft is operated under the operating certificate of the lessee and the lessee has operational control. From any operational standpoint, dry lease of an aircraft by an air operator does not normally present a significant problem. Operational control of any dry leased aircraft rests with the lessee. In most dry lease agreements, the lessor is a bank, a leasing company, or a holding company which has neither the operational expertise and infrastructure nor the desire to assume responsibility and liability for controlling daily operations of the leased aircraft. The air operator leasing the aircraft applies for an

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amendment of its operations specifications to list the leased aircraft. If an aircraft is dry leased from another operator, the lease agreement must be explicit concerning the maintenance program and Minimum Equipment List to be followed during the term of the dry lease.

**E. Dry Lease-In.** Any dry leasing arrangement when the lessee receives from the lessor an aircraft.

**F. Dry Lease-Out.** Any dry leasing arrangement when the lessor provides the lessee with an aircraft.

**G. Wet Lease.** Any leasing arrangement when the aircraft is operated under the operating certificate of the lessor and the lessor has operational control. A wet lease is a commercial arrangement whereby an aircraft owner leases the aircraft (and usually the crew) to another person for his exclusive use for a specified period or a defined number of flights.

**H. Wet Lease-In.** Any wet leasing arrangement when the lessee receives from the lessor an aircraft.

**I. Wet Lease-Out.** Any wet leasing arrangement when the lessor provides the lessee with an aircraft.

**J. Operator.** With respect to aircraft, means the person with operational control.

**K. Use.** With respect to a leased aircraft, means to employ for some purpose, to put into service; to avail oneself of, to apply to one's own purposes.

**4.16.1.5. LEASING RULES IN THE KINGDOM OF SAUDI ARABIA (KSA).** The subject of leasing is addressed in the Civil Aviation Law, the General Authority of Civil Aviation (GACA) Economic Regulations and the General Authority of Civil Aviation Regulations (GACARs). The relevant leasing regulations for General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) are found in GACAR §§ 119.53 and 119.89 and its associated GACAR Part 119, Appendix A. All lease agreements must be authorized by the President prior to their implementation. The kinds of lease arrangements and their associated criteria and key requirements that are address in the GACAR are repeated below:

**A. Leasing of Aircraft between Air Operator Certificate (AOC) Holders Certificated under GACAR Part 121 or 135.**

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1) *Dry lease-in.* An AOC holder may dry lease-in an aircraft from another AOC holder. In this case, the lessee must become the operator of the aircraft and be qualified and authorized to conduct operations with that aircraft type.

2) *Wet lease-out.* An AOC holder may wet lease-out an aircraft to another AOC holder. In this case, lessor must remain the operator of the aircraft.

### **B. Leasing of Aircraft between an AOC Holder Certificated under GACAR Part 121 or 135 and any entity other than another AOC certificated under GACAR Part 121 or 135.**

1) *Dry lease-in Saudi Arabian-registered aircraft.*

a) An AOC holder certificated under this part may dry lease-in an aircraft from an entity provided the AOC holder ensures that, with regard to aircraft that are dry leased-in:

- The aircraft complies with and is equipped with all applicable requirements for the intended commercial operations
- The aircraft must be maintained in accordance with the applicable airworthiness requirements
- The aircraft must be operated in compliance with the applicable regulations

b) In this case, the lessee must become the operator of the aircraft and be qualified and authorized to conduct operations with that aircraft type.

2) *Dry lease-in foreign registered aircraft.*

a) Except as otherwise provided for in an Article 83bis agreement, an AOC holder certificated under this part may dry lease in a foreign registered aircraft from an entity provided the AOC holder ensures that, with regard to aircraft that are dry leased in:

- The aircraft complies with and is equipped with all applicable requirements for the intended commercial operations as if it were a Saudi Arabian registered aircraft, or any differences from the requirements prescribed in the applicable GACAR, have been communicated to and are acceptable to the President

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- The flight crew hold current valid and appropriate certificates or licenses issued or validated by the State of Registry
  - The aircraft must be maintained in accordance with the airworthiness requirements of the State of Registry
- b) In this case, the lessee must become the operator of the aircraft and be qualified and authorized to conduct operations with that aircraft type.
- 3) *Wet lease-in.*
- a) An AOC holder certificated under this part may wet lease-in an aircraft from an entity provided they ensure that, with regard to aircraft that are wet leased-in:
- The safety standards of the lessor with respect to maintenance and operation are equivalent to those established by the GACAR
  - The lessor is an operator holding an AOC issued by an International Civil Aviation Organization Contracting State
  - The aircraft has a standard Certificate of Airworthiness issued in accordance with Annex 8 to the International Convention on Civil Aviation
  - Any other requirement specified by the President is complied with
- b) In this case, lessor must remain the operator of the aircraft.
- 4) *Dry lease-out.* An AOC holder certificated under this part may dry lease-out an aircraft to an entity. In this case, the aircraft will be removed from the operations specifications of the AOC holder certificated under this part.
- 5) *Wet lease-out.* An AOC holder certificated under this part may wet lease-out an aircraft to another entity. In this case, lessor must remain the operator of the aircraft.

### C. For all Lease-In Operations.

- 1) Prior to conducting lease-in operations, the lessee must provide the President with:

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- A copy of the lease to be executed
- The names of the parties to the agreement and the duration thereof
- The nationality and registration markings or aircraft serial number of each aircraft involved in the agreement

### **D. For all Lease-Out Operations.**

1) Prior to conducting lease-out operations, the lessor must provide the President with:

- A copy of the lease to be executed
- The names of the parties to the agreement and the duration thereof
- The nationality and registration markings or aircraft serial number of each aircraft involved in the agreement
- The aerodromes or areas of operation

### **E. For all Lease-In Operations Involving Foreign Registered Aircraft.**

1) Prior to conducting lease-in operations involving foreign registered aircraft the AOC holder certificated under GACAR Part 119 must provide the President:

- A statement specifying which air carrier (the lessee or the lessor) has operational control of all operational functions
- A statement specifying which air carrier (the lessee or the lessor) will be discharging all of the applicable airworthiness and maintenance responsibilities
- A statement of acknowledgment and consent to the lease agreement by the civil aviation authority of the State of the lessor

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#### **CHAPTER 16. LEASE AGREEMENTS FOR PARTS 121 AND 135**

##### **Section 2. Determining Who Has Operational Control**

###### **4.16.2.1. Basis for Determining Operational Control.**

A. The question of who has operational control in a lease agreement is very important because it defines whether the lease is considered by the General Authority of Civil Aviation (GACA) to be a wet or dry lease. The GACA defines that a party has operational control of flights if that party exercises authority and responsibility for a specified number of operational functions. In cases where doubt or controversy exists, the President also considers additional factors such as who is responsible for maintenance, servicing, and crew member training. Operational functions include:

- Provision of one or more crew members
- Provision of the training of those crew members
- Assigning crew members for particular flights
- Directly paying crew members for services
- Responsibility for airworthiness
- Responsibility for performance of maintenance
- Dispatch of flights
- Initiating and terminating flights

B. The Principal Operations Inspector (POI) will determine whether the lessor or lessee has operational control. Such determination will be based on a careful review of the lease arrangement, and any other circumstances regarding the actual operation.

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### CHAPTER 16. LEASE AGREEMENTS FOR PARTS 121 AND 135

#### Section 3. Processing Lease Agreement Authorizations

##### 4.16.3.1. GACA ACTIVITY REPORT (GAR).

A. 3359 (AW)

##### 4.16.3.3. GENERAL.

**A. Common Processes for All Lease Authorizations.** This paragraph outlines the processes common to all kinds of lease authorizations. Later paragraphs include detailed requirements for each kind of lease authorization permitted under the General Authority of Civil Aviation Regulation (GACAR).

**B. Determine Which General Authority of Civil Aviation (GACA) Principal Operations Inspector (POI) is Responsible.** Approval of the Operations Specifications (OpSpecs) is the responsibility of the POI who is responsible for the operator exercising operational control of the aircraft. The Party (lessee or lessor) who has operational control can be determined by using the guidance in Section 2 of this Chapter. If two POIs are involved in the leasing arrangement, the POIs will coordinate the matter and agree on respective responsibilities based on the terms of the lease arrangement.

##### 4.16.3.5. COORDINATION REQUIREMENTS.

This task requires coordination with the Principal Maintenance Inspector, and the Principal Operations Inspector. This task may also require coordination with foreign Civil Aviation Authorities.

##### 4.16.3.7. LEASING BETWEEN PART 119 AIR OPERATOR CERTIFICATE (AOC) HOLDERS.

Leasing of aircraft between commercial air operators certificated under GACAR Part 119 is a relatively straightforward situation as the aircraft involved has already been shown to comply with GACAR requirements and the air operators have already been certificated by the GACA.

**A. Dry Leasing.** An AOC holder may dry lease-in an aircraft from another AOC holder. In this case, the lessee must become the operator of the aircraft and be qualified and authorized to conduct operations with that aircraft type. This situation becomes very much like simply adding

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another aircraft to the fleet of the lessee. An interchange agreement is a subset of a dry lease agreement. An interchange agreement permits an air operator to dry lease aircraft to another air operator for short periods of time. The aircraft may be listed on the operations specifications of both air operators at the same time. The registration markings and serial numbers of each aircraft must be listed on the operations specifications of each air operator. Each operator must obtain prior authorization from the President before it conducts any operation using any aircraft. Matters which are commonplace in the normal operations of air operator frequently present major problems in an aircraft interchange. Therefore, special emphasis must be given to the review, approval, and monitoring of this type of operation. The following direction and guidance is relevant when an application is received for an aircraft interchange. Each air operator party to an interchange agreement will submit an application for amendment of its operations specifications to the GACA. Each air operator will submit a copy of the interchange agreement or a written memorandum of its terms as part of the application. Assigned inspectors will review the application and conduct the necessary evaluations and/or inspections to assure compliance with GACAR § 119.53. The results of these reviews and inspections will be coordinated between the POIs having jurisdiction over the operations specifications of the parties to the interchange agreement. Close coordination between the concerned principal operations, and maintenance inspectors must be maintained. Important details may be overlooked, unless interchange operations are closely monitored. For example, life rafts and emergency radios have been found improperly stowed during overwater flights on aircraft which have no provisions for their stowage. In another example, an emergency radio was found unsecured on the flight deck where it could have created a hazardous condition in turbulent weather. Equipment variances such as this and nonstandard cockpit arrangements of switches, instruments, and controls can be potentially dangerous unless effective training or corrective changes are accomplished before operation and are closely monitored thereafter.

2) *Maintenance Guidelines.* This following information provides additional maintenance guidance for authorizing an operator (lessee) to maintain a dry leased aircraft in accordance with the previous operator's (lessor's) current and approved maintenance program for that type of aircraft.

a) GACAR Part 121 or 135 operators have leased aircraft from other air carriers with the understanding that the aircraft will be returned to the previous operator upon termination of the lease. It may be to the lessor's advantage to have the aircraft maintained under the lessor's maintenance program rather than the lessee's program so that it can be readily integrated back into the fleet when the lease expires.

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b) The key factor in this type of arrangement is the lessee's capability of accomplishing the program to the lessor's standards. The lessee's responsibility for the effectiveness of the adopted

**B. Wet Leasing.** An AOC holder may also wet lease out an aircraft to another AOC holder. In this case, lessor must remain the operator of the aircraft.

### **4.16.3.9. LEASING OF AIRCRAFT BETWEEN AN AOC HOLDER CERTIFICATED UNDER GACAR PART 121 OR 135 AND ANY ENTITY OTHER THAN ANOTHER AOC CERTIFICATE HOLDER UNDER GACAR PART 121 or 135.**

**A. Dry-Lease-In Saudi Registered Aircraft.** From any operational standpoint, dry lease-in of an aircraft by a Kingdom of Saudi Arabia (KSA) air operator does not normally present a significant problem. Operational control of any dry leased-in aircraft rests with the operator lessee. In most dry lease agreements, the lessor is a bank, a leasing company, or a holding company which has neither the operational expertise and infrastructure nor the desire to assume responsibility and liability for controlling daily operations of the leased aircraft. The air operator leasing the aircraft applies for an amendment of its operations specifications to list the leased aircraft. If an aircraft is dry leased-in from another operator, the lease agreement must be explicit concerning the maintenance program and Minimum Equipment List to be followed during the term of the dry lease. If the dry lease-in is from a third party (non-operator) such as a leasing company or bank then the lessee's maintenance program and Minimum Equipment List must adequately account for the leased aircraft or changes must be made and approved prior to the commencement of the lease arrangement.

**NOTE:** The GACARs prohibit the listing of an aircraft on both non-commercial Part 125 operations specifications and commercial Part 121 operations specifications at the same time.

**B. Dry-Lease-In Foreign Registered Aircraft.** The following provides guidance for ensuring that dry leased-in foreign registered aircraft, intended for use by air carriers in the KSA, meet the General Authority of Civil Aviation Regulations (GACAR) Part 121 or Part 135 requirements.

1) A Saudi Arabian air carrier may operate a foreign-registered civil aircraft in GACAR Part 121 or Part 135 service. Such aircraft may be wet leased-in or dry leased-in in accordance with GACAR § 119.53 and the associated Appendix A to GACAR Part 119. This paragraph

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addresses dry leased-in of foreign registered aircraft only. The country of aircraft registry of dry leased-in aircraft must be a Contracting State of the convention of the International Civil Aviation Organization (ICAO).

2) *Coordination Requirements Dry-Lease In Foreign Registered.* This task requires coordination between the Principal Inspectors (Operations and Airworthiness) and the operator, and may involve coordination with the Civil Aviation Authority (CAA) of the State of Registry of the aircraft. Any coordination with foreign CAAs should be carried out in accordance with guidance in Section 4.

3) *Evaluate the Foreign Maintenance Program, if Adopted.*

a) Ensure that the program meets levels of safety that are equivalent to the operator's existing program. If the operator does not have a program for the aircraft listed, the lessor's foreign program must be submitted to the GACA and be justified as an acceptable initial maintenance program.

b) List all program differences and exemptions in OpSpec A28.

**C. Wet Lease In From a Foreign Air Carrier.** The following provides guidance on the requirements for wet lease-in aircraft for operations being conducted by a Saudi Arabian air operator. This information is specific to Wet Lease-In operations.

1) *Definition.* As defined in GACAR § 119.53, a wet lease-in is any leasing arrangement whereby a foreign air carrier agrees to provide an entire aircraft and they (the lessor) retains operational control at all times.

2) *GACA Pre-Authorization Lease from an Entity.*

a) An operator may apply to the GACA for pre-authorization of a wet lease-in. This has the advantage of operating flexibility for the operator and minimum delay in obtaining approval in the event of an actual requirement for extra lift or for a substitute aircraft. The operator may be able to have a wet lease-in agreement with other foreign air carriers for seasonal extra lift, or a short notice request for flights. In such situations a pre-authorization may be granted by the GACA subject to the operator submitting an application with details of the foreign air carrier and the required supporting documents described in this section. A pre-requisite is that:

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- The State of the Lessor should be an FAA Category One State
  - The State of the Lessor and the State of Registry or any aircraft used (if different than the State of Lessor) is not included in the European Ban list
- b) Where the State of the Lessor and State of Registry (if different) is the United States (US) or a State of the European Union (i.e. under the authority of the European Aviation Safety Agency (EASA)), then the process may be simply a table-top exercise. On the other hand, where there is any doubt about the safety standards of a State, the GACA may require a full assessment of the safety standards of the State of the Lessor or State of Registry, which may include a formal audit of the Lessor.

3) *Review of Agreements.*

a) General Requirements. An AOC holder certificated in the Kingdom of Saudi Arabia (KSA) is prohibited from allowing another foreign air carrier to conduct wet lease-in operations unless it is authorized by the President. Such authorization is conditional upon the following:

- The safety standards of the Lessor with respect to maintenance and operations are at least equivalent to the GACARs
- The Lessor holds an Air Operator Certificate (AOC) or its equivalent from an ICAO Contracting State that authorizes those operations
- The aircraft has an Airworthiness Certificate issued in accordance with Annex 8 of the Chicago Convention

b) Before embarking on a wet lease-in agreement an air operator should establish that:

- The Lessor's operations specifications include the aerodrome/area of operation required by the air operator (lessee)
- The designated aircraft have the necessary approvals and equipment required to operate the proposed routes
- ~~The designated aircraft shall not be more than 25 years of age~~

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- Assigned crews are route qualified where applicable
- c) When a wet lease-in agreement involves only flight crew, the air operator (lessee) must ensure that his cabin crews receive the required training with respect to their cabin safety and emergency duties on such aircraft by the foreign air carrier (lessor) who will also provide training records of such training. This training must include crew coordination training with the Lessor's flight crew. In addition, cabin crew must be made aware of the State of Operator's requirements with respect to duty time limitations and the performance of their duties and responsibilities aboard the wet leased aircraft. Because of these complications, the GACA will generally accept only wet lease-in arrangements with a complete crew. The lessee may arrange for a cabin crew member or airline representative from its own operation to act as a public relations person on the wet lease-in operations to represent the image of the airline as required. That person will not be considered a member of the cabin crew.
- d) At least 15 calendar days prior to intended wet lease-in operations, the lessee is required to submit a copy of the lease agreement or a written memorandum of the terms of the lease to the GACA for processing.
- e) The lease agreement or written memorandum will be reviewed by the GACA to ensure completeness. The GACA inspector will also make an operational assessment of the ability of the Lessor to maintain operational control under the terms of the lease.
- f) The Lessor must submit the following information regarding the lease for a proper determination to be made on operational control:
  - A copy of the Lessor's Air Operator Certificate
  - A copy of the Lessor's Operations Specifications
  - A list of the aircraft registration and serial numbers of all the aircrafts, which will be used in the wet lease-in operations
  - A list of pilots names, license numbers and license validity date
  - A list of names of all maintenance personnel who will be maintaining the aircraft during the period of the lease

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- Name of contact person at Lessor's CAA
- An official letter from the Lessor's CAA to the GACA that they are aware of the leasing arrangements and assume oversight responsibility for the operations under ICAO Annexes 1, 6 and 8
- A copy of the lease agreement with details of the lease, including a clear statement that Lessor maintains operational control

**D. Dry Lease-Out.** This task requires coordination between the Principal Inspectors (Operations and Airworthiness) and the operator (lessee), and may involve coordination with the foreign Civil Aviation Authority (CAA) if the lessee is a foreign entity.

**E. Wet Lease-Out.** An AOC holder certificated under this part may wet lease-out an aircraft to another entity. In this case, lessor must remain the operator of the aircraft.

### 4.16.3.11. PROCEDURES FOR PROCESSING LEASE ARRANGEMENTS.

**A. Determine if a Lease Agreement Has Occurred.** Request a copy of the lease or lease memorandum.

- 1) Ensure the names of the parties to the lease agreement and the duration thereof are specified.
- 2) Review the lease arrangements permitted under the provisions of Part 119, Appendix A.

**B. Schedule and Conduct an Informal Meeting.** The operator/applicant must indicate if its intention is to utilize aircraft under a lease arrangement with the use of the lessor's maintenance program. If this is the case, advise the operator/applicant of the following requirements:

- 1) The aircraft must conform with all applicable requirements of GACAR Part 121 or 135
- 2) The lessee must have the capability to support and maintain aircraft in accordance with the lessor's program to include:
  - Personnel

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- Training
- Facilities
- Equipment
- Manuals

3) The lessee must have current records to determine the status of the following:

- Scheduled inspections
- Airworthiness Directives
- Life limited items
- Time controlled components

4) The lessee must have the current weight and balance data for the leased aircraft.

5) The lessee must provide a copy of the contract between the lessor and lessee to the GACA Inspector.

6) Lessee must initiate procedures for transfer of aircraft maintenance and performance data to lessor.

7) Lessee must have procedures that ensure that maintenance programs for the leased aircraft and the lessee's own are kept separate and are applied to the respective aircraft.

**C. Conduct Formal Meeting.** The operator should state that aircraft, records, facilities are ready for inspection and must present required data and proposed operations specifications.

**D. Review the Lease Agreement.** Examine the following:

- Determine maintenance responsibilities
- Determine data reporting requirements

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**E. Determine Who Has Operational Control.** Use the guidance in Section 2 of this Chapter to make the determination.

**F. Determine the Kind of Lease Agreement.** By knowing whether the lessor and lessee are air operators certificated under GACAR Part 119, knowing which air operator (the lessor or lessee) has operational control, and by knowing what is the State of Registry of the leased aircraft, it is possible to know which kind of lease arrangement it is in accordance with the permitted lease arrangements as specified in GACAR Part 119 (see the arrangements listed in Section 1 of this Chapter for details).

**G. Review the Lease in Detail.** Ensure that:

- The lessor and lessee are properly identified on the lease
- The lease is signed by the appropriate personnel in both the lessor's and the lessee's organizations
- All strikeovers, erasures, and corrections are initialed by both the lessor and the lessee
- The aircraft subject to the lease agreement are identified by aircraft make and model, registration number, and serial number
- The effective dates of the lease are identified
- Operational control is specifically designated
- Responsibilities for performing maintenance are specifically designated
- Responsibilities for keeping aircraft maintenance records are specifically designated
- Maintenance programs (lessee's or lessor's) that will be utilized are designated
- For lease-out situations, ensure the aerodromes or areas of operation are listed

**H. For all Lease-In Operations Involving Foreign Registered Aircraft.** Ensure that:

- A statement is provided specifying which air carrier (the lessee or the lessor) has operational control of all operational functions

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- A statement is provided specifying which air carrier (the lessee or the lessor) will be discharging all of the applicable airworthiness and maintenance responsibilities
- A statement of acknowledgment and consent to the lease agreement is provided by the civil aviation authority of the State of the lessor

### **I. Review the Lessee's Manuals** . Ensure that the manual includes the following:

- Procedures adequate to incorporate the leased aircraft into his operating system (aircraft acceptance checks, etc.)
- Provisions in the maintenance training program to account for any differences in the configuration of the leased aircraft from the existing fleet
- A program that is adequate to provide for configuration differences if the aircraft is to be maintained under the lessee's maintenance program
- A MEL that is applicable to the leased aircraft

### **J. Review the Aircraft Maintenance Records.** See Volume 4, Chapter 11 for further details on evaluating maintenance records.

### **K. Perform an Aircraft Conformity Inspection.** After performing the inspection, review the results to ensure that the differences between the leased aircraft and the aircraft already in operation are identified and will be addressed in the OpSpecs and the lessee's maintenance manual.

#### **4.16.3.13. AMENDING OPERATIONS SPECIFICATIONS.**

**A.** When all items have been found satisfactory, the OpSpecs of the operators certificated under GACAR Part 119 (lessee, lessor or both) shall be amended by the issuance of OpSpec A28. For dry leasing between Air Operator Certificate (AOC) holders the names of each party (lessor and lessee) shall be entered in the appropriate column of OpSpec A28 of each operational specification.

**B.** The aircraft make, model, and series shall be entered in the appropriate column of OpSpec A28 of the operations specifications. In addition, the registration markings of each aircraft to be used

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in the interchange agreement must be identified in OpSpec D85 of the primary and interchange operator's operations specifications. For most dry lease agreements between AOC holders, the registration markings of the aircraft to be leased will have previously been entered in OpSpec D85 of the lessor's operator's operations specifications.

**C.** Additional conditions, limitations, and safety related requirements shall be included OpSpec A28 of the AOC holder's operations specifications as authorized by GACAR §§ 119.53 or 119.89.

### **4.16.3.15. TASK OUTCOME.**

**A. Document Task.** File all supporting paperwork in the operator's office file

**B. GAR.** Complete the GAR.

**C. OpSpecs.** Issue the applicable OpSpecs.

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## VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION

### CHAPTER 16. LEASE AGREEMENTS FOR PARTS 121 AND 135

#### Section 4. Special Considerations for Lease Arrangements Involving Foreign-Registered Aircraft or Foreign Air Operators

**4.16.4.1. GENERAL.** This section provides guidance for inspectors dealing with special considerations of lease arrangements that involve foreign aircraft or foreign air operators. To accomplish this task will require close coordination with the foreign Civil Aviation Authority's (CAA's) office that maintains regulatory oversight of the aircraft or air operator involved in the lease arrangement.

**4.16.4.3. CAA COORDINATION.** Aviation safety inspectors (Inspectors), in their review of this lease arrangement must carefully coordinate with the foreign CAA, both the State of the Operator and the State of Aircraft Registry if different. During these discussions Inspectors must ensure that the obligations of the State of Registry and the Operator have been met according the agreement to include discussion to determine that the pilots are properly licensed or certificated by the State of Registry in accordance with International Civil Aviation Organization (ICAO) guidelines.

#### 4.16.4.5. FOREIGN AIRWORTHINESS CERTIFICATES.

**A.** The airworthiness requirements of foreign countries may differ from Saudi Arabian requirements. Since a foreign-registered, leased-in aircraft must meet Kingdom of Saudi Arabia (KSA) requirements, changes may have to be made before a KSA operator can use a leased-in foreign aircraft. Such changes may invalidate the airworthiness certificate. In such cases, an exemption may be required from the foreign airworthiness authority.

**B.** To maintain the validity of the foreign airworthiness certificate, the Saudi Arabian operator may have to perform more extensive inspections or tests than those required by their General Authority of Civil Aviation (GACA) approved continuous airworthiness maintenance program (CAMP) and/or the General Authority of Civil Aviation Regulation (GACARs)

**4.16.4.7. DIFFERENCES AND/OR EXCEPTIONS OF MAINTENANCE TASKS.** The following maintenance tasks may be different from the foreign operator's maintenance program and they will be exceptions to the foreign program. These exceptions shall be performed according to the operator's

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maintenance program. Examples of differences are as follows:

- Inspection/maintenance of required emergency equipment
- Inspection/maintenance of encoding altimeters and transponders
- Inspection/maintenance of fire extinguishers, air and oxygen bottles, and hydrostatic tests and life limits.

**NOTE:** These differences and/or exceptions must be evaluated to ensure that the requirements needed to keep the foreign certificate of airworthiness current are retained.

**4.16.4.9. LEASE ARRANGEMENTS INVOLVING ARTICLE 83bis AGREEMENTS.** GACAR Part 9 prescribes rules that are applicable for aircraft leasing arrangement involving aircraft subject to an Article 83bis agreement. Volume 11, Chapter 9 provides additional information concerning the processing of an Article 83bis agreement.

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### **VOLUME 4. OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 17. PROVING AND VALIDATION TESTS FOR PARTS 121 AND 135**

##### **Section 1. General Information**

**4.17.1.1. GENERAL.** General Authority of Civil Aviation Regulation (GACAR) Parts 121 and 135 require the President to evaluate each applicant's ability to conduct operations safely and in accordance with the applicable regulations before issuing an operator certificate (AOC). The GACARs also require the President to determine that an operator/applicant is capable of conducting operations safely and in compliance with applicable regulatory standards before authorizing the operator to serve an area or route or before authorizing new special flight operations. The structured methods used by the General Authority of Civil Aviation (GACA) to determine an applicant's capabilities are proving and validation tests. Sections 1 through 7 contain direction and guidance for aviation safety inspectors (Inspectors) to use for conducting proving tests. Section 8 contains direction and guidance for conducting validation tests. Proving and/or validation testing is usually accomplished in conjunction with an operator's initial certification. See Volume 3, Air Operator and Air Agency - Certification, for additional guidance.

**NOTE:** The term "applicant", as used in this chapter means either a candidate applying for an operator certificate or an existing operator requesting additional operating authority.

**4.17.1.3. PROVING TESTS.** GACAR §§ 119.39, 121.221, 121.225 and 135.113 require applicants seeking authority to operate certain types of aircraft and/or new kinds of operations in commercial service to prove their capability before being granted operating authority. These applicants must conduct proving tests.

**A. Testing Overview.** Proving tests consist of a demonstration of the applicant's ability to operate and maintain an aircraft new to the operator's fleet, or the applicant's ability to conduct a particular kind of operation. The applicant is required to operate and maintain the aircraft to the same standards required of an operator that is fully certificated and that holds the necessary authorizations.

**B. Comprehensive Testing Areas.** Do not confuse proving tests with aircraft certification tests, which are tests conducted by the aircraft manufacturer to demonstrate the airworthiness of the aircraft under GACAR Part 21 (or equivalent foreign regulations). Proving tests are

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comprehensive in nature and focus on multiple areas. Examples of these areas include:

- Cabin safety
- Operational control
- Abnormal procedures
- Minimum equipment list (MEL) management
- Ability to operate the aircraft in Kingdom of Saudi Arabia (KSA) airspace
- Ability to safely operate the aircraft at actual (Part 121) or representative (Part 135) destinations

**NOTE:** See Sections 2 through 7 of this Chapter for specific guidance on proving flights.

**4.17.1.5. VALIDATION TESTS.** GACAR §§ 119.107, 121.225 and 135.113 require applicants to demonstrate the capability to conduct operations over proposed routes or areas in compliance with regulatory requirements before being granted GACA authority to conduct those operations. The GACA requires the applicant to successfully complete validation testing. The following are some examples that require validation testing:

- The addition of an aircraft for which two pilots are required for operations under VFR or a turbojet airplane, if that aircraft or an aircraft of the same make or similar design has not been previously proved or validated in operations
- Operations outside KSA airspace
- Special performance or operational authorizations

**NOTE:** See Section 8 of this Chapter for specific guidance on validation testing.

**NOTE:** Though proving and validation tests satisfy different requirements, both tests may be conducted simultaneously when appropriate.

**4.17.1.7. TESTING METHODS ACCEPTABLE TO THE PRESIDENT.** Applicants must demonstrate to the President that they can conduct flight and maintenance operations to the highest

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level of safety.

**A. Evaluating Operations.** Operations may vary in complexity. For example, an operation may involve an operator seeking to expand their network beyond the Middle East into Europe and North America. The operator must develop the appropriate procedures and training to meet the new operational requirements to conduct the expanded operation.

**B. Complex Operations.** For the more complex operations, such as Category II (CAT II), Category III (CAT III), Extended Operations (ETOPS), and polar operations, operators may prove their competence as determined by the President by using methods such as flight simulation, tabletop exercises, and operational research. An applicant may use other methods, provided that the applicant can demonstrate:

- The validity and reliability of the testing method
- The test results verify acceptable applicant performance
- The method used is acceptable to the President

**NOTE:** The proving and validation test process follows the general process for approval or acceptance that is described in Volume 1, Chapter 4, Section 1 in this handbook.

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### VOLUME 4. OPERATOR & AIR AGENCY - ADMINISTRATION

#### CHAPTER 17. PROVING AND VALIDATION TESTS FOR PARTS 121 AND 135

##### Section 2. The Proving and Validation Test Process

**4.17.2.1. TEST PROCESS.** All General Authority of Civil Aviation Regulation (GACAR) Part 121 and 135 applicants will use the five-phase process found in this section that includes both proving and validation testing. The certification project manager (CPM) will ensure the completion of the General Authority of Civil Aviation (GACA) Activity Report (GAR) entry requirements, described in this section.

**NOTE:** Use Figure 4.17.2.1, General Purpose Proving and Validation Test Job Aid, for all applicants.

**4.17.2.3. PHASE ONE.** Phase One of the proving and/or validation test process begins when an applicant requests authorization from the General Authority of Civil Aviation (GACA) to conduct an operation for which proving or validation testing is required. The following steps apply:

**A. Initial Contact Meeting.** During the initial contact meeting, determine the need for proving and/or validation testing. Testing is required for:

1) *GACAR Part 121:*

- Applicants seeking authority to operate new types of aircraft and/or new kinds of operations
- Materially altered aircraft
- Applicants seeking authorization to conduct operations over proposed routes or areas in compliance with regulatory requirements

2) *GACAR Part 135:*

- Applicants seeking authority to operate an aircraft, other than a turbojet aircraft, for which two pilots are required for operations under Visual Flight Rules (VFR), if it has not previously proved such an aircraft in operations

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- Applicants seeking authority to operate a turbojet airplane if it has not previously proved a turbojet airplane in operations
- Applicants seeking authority to operate a single-engine turbine-powered airplane at night and/or in Instrument Meteorological Conditions (IMC) if it has not previously proved a single-engine turbine-powered airplane in operations at night and/or IMC in proving tests acceptable to the President including
  - The addition of an aircraft for which two pilots are required for operations under VFR or a turbojet airplane, if that aircraft or an aircraft of the same make or similar design has not been previously proved or validated
  - Operations outside KSA airspace
  - Special performance or operational authorizations

**B. Assignment of the GACA Test Team.** The Direction, Flight Operations Division generally designates the GACA test team for all Part 121 and 135 applicants. The test team consists of the following:

1) *Certification Project Manager (CPM)*. The CPM conducts, coordinates, and evaluates the test. In addition, the CPM represents the President on all matters pertaining to the test and speaks for the President.

**NOTE:** The term “Certification Project Manager”, will be used for both an initial entrant certification and an operator wishing to expand the scope of their operation.

2) *Other Team Members*. The GACA test team should include the following personnel, as required by the requested type of authorization(s):

- All assigned Principal Inspectors (PIs) (Operations & Airworthiness)
- An aviation safety inspector (Inspector) (Operations) qualified on the specific aircraft type, if applicable
- Inspectors trained on the installed equipment

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- Cabin safety inspector (CSI), if applicable

**NOTE:** If the certification is for a cargo-only operation, the team must consider cabin safety issues if the applicant has provisions or procedures for carrying those persons listed in GACAR § 121.1233.

**C. Preliminary Coordination.** The CPM and the applicant must reach a common understanding of what the applicant must do, what role the GACA will play, and what reports and documents the applicant must prepare during the testing process. Both the test team and the applicant should research applicable regulatory and advisory material on such matters as:

- The number of validation test flight(s), if applicable
- Representative routes
- Required navigation and communication equipment
- Specific training for crew members and dispatchers and flight followers
- The inclusion of appropriate procedures in the operator's manuals

**D. GAR Entry.** The CPM opens a GAR for the applicant following the assignment and formation of the test team. Keep this GAR entry open until the team completes its assignment. Enter the record number of this entry in the "Miscellaneous" field in all subsequent GAR entries associated with the project. This procedure creates a complete record of proving and validation, and eliminates the need for a manually written report.

**4.17.2.5. PHASE TWO.** Phase Two begins when the applicant submits the formal test plan to the GACA for evaluation. The following steps apply:

**A. Formal Test Plan.** The test plan must include at least the following information:

- Identification of the company coordinator
- Detailed schedule of all proposed flights
- List of names and positions of flight crew members on each flight

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- Names, titles, and company affiliation of all non-crew members on each flight
- Applicant's plan for reducing test hours (if applicable)

**B. GACA Test Team Initial Review.** Before the test team analyzes the plan in phase three, the CPM ensures completeness and acceptability of the plan. In addition, the CPM updates the master GAR record. See Section 4, Planning the Proving Test, for further guidance.

**4.17.2.7. PHASE THREE.** Phase Three begins when the GACA test team starts an in-depth review and analysis of the applicant's test plan. During this phase, the GACA must plan to coordinate its activities with the demonstrations that the applicant will conduct during phase four.

**A. GACA Test Team In-Depth Review of Test Plan.** The GACA test team should review the test plan for:

- 1) *Regulatory compliance.*
- 2) *Safe operating practices.*
- 3) *Logic of sequence.*
- 4) *Other areas* (e.g., training programs, crew/dispatcher qualifications, operational control issues, acceptable participants, schedules, and competent/appropriately trained company personnel located at all points along the proposed route).
- 5) *Outsourced Service Providers.* Applicant having appropriately trained outsourced service providers under contract (if required) in at least, but not limited to, the following areas:
  - Aircraft handling and proper servicing
  - Cargo loading and control
  - Deicing when appropriate
  - Flight operations
  - Applicant's maintenance procedures

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- Preventative maintenance of the applicant's aircraft and auxiliary equipment

**B. Emergency Evacuation or Ditching.** If an emergency evacuation demonstration or ditching demonstration is required, the team also needs to review those associated test plans during this phase.

**NOTE:** See Figure 4.17.2.1 for a list of applicable company manuals and programs.

**C. CPM Responsibilities.** The CPM's responsibilities include:

- Notifying the Director of the Flight Operations Division and the Director of the Airworthiness Division of proving and/or validation flight dates, times, and flight itineraries
- Assigning appropriate sections of the test plan to Inspectors or specialists for review and comment
- Coordinating with the representative of the applicable security department to obtain Security Inspector assistance
- Ensuring that administrative requirements such as visas and country clearances are obtained in a timely manner
- Updating the master GAR record

**D. Team Member Responsibilities.** Team members are responsible for:

- Performing assigned tasks
- Keeping the CPM informed of all actions
- Ensuring that the CPM concurs with all agreements made with the applicant
- Recording each activity accurately and completely in their individual GAR and placing the assigned number in the "Miscellaneous" field

**4.17.2.9. PHASE FOUR.** Phase Four is the inspection and demonstration phase of the test process.

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**A. Proving/Validation Flights.** For proving and/or validation flights, the applicant must satisfactorily complete the en route flight segment and the maintenance test portion of the proving and/or validation test plan.

**B. Tests Not Requiring Flights.** For validation tests not requiring flights, the applicant must satisfactorily accomplish all test objectives.

**NOTE:** Ensure that all applicants have received the proper economic authority before commencing the proving flights (if applicable).

**C. GACA Management Concurrence.** Before concluding phase four, the CPM obtains the concurrence of the Director, Flight Operations Division and the Director, Airworthiness Division.

**4.17.2.11. PHASE FIVE.** The successful completion or termination of the proving or validation tests marks the accomplishment of phase five. In this phase, the CPM:

- Ensures the applicant has received economic authority (if applicable)
- Recommends to the PIs the approval and issuance of the appropriate operation specifications (OpSpecs)
- Sends a letter to the applicant terminating the proving test (if applicable) (Figure 4.17.5.2)
- Completes the report by closing the original GAR record that was opened in phase one
- Ensures all team members have closed their individual GAR records

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Figure 4.17.2.1. General Purpose Proving and Validation Test Job Aid

Operator Official Name/Certificate #:					
PHASE ONE. REQUEST FOR AUTHORIZATION					
GAR CODE		INSP.'S INITIAL	DATE REC'D	DATE ACCEP'D	NOTES
	1. Applicant Request (if applicable)				
	2. Initial Contact Meeting				
	a. Determine need for proving and/or validation testing				
	b. Applicant advised of applicable guidance, to include this job aid				
	4. Assign GACA Test Team				
	5. Internal GACA Coordination				
	6. Open master GAR Record # _____				
PHASE TWO. PROVING/VALIDATION TEST PLAN					
GAR CODE		INSP.'S INITIAL	DATE REC'D	DATE ACCEP'D	NOTES
	1. Applicant submits Formal Test Plan				
	a. Identification of company coordinator				
	b. Detailed schedule of all proposed flights				
	c. List of names & positions of flight crew members on each flight				

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	d. Names, titles & company affiliation of all non-crew members on each flight				
	e. Applicants plan for reducing test hours (if applicable)				
	2. GACA CPM initial review of test plan				
	3. Update master GAR record				

**PHASE THREE. GACA TEST TEAM PLAN REVIEW**

GAR CODE		INSP.'S INITIAL	DATE REC'D	DATE ACCEP'D	NOTES
	1. Evaluate test plan for regulatory compliance, safe operating practices, logic of sequence, etc.				
	2. Manuals/Procedures (as applicable): a. Operations Manual (OM)				
	b. Maintenance Manual (MM)				
	c. Maintenance Technical Manuals				
	d. Cockpit Normal/Abnormal/ Emergency Checklists and Procedures				
	e. Aircraft Flight Manual (AFM)				

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	f. Cabin crew member Manual				
	g. Company Emergency Manual				
	h. Passenger Briefing Cards				
	i. Aircraft Fueling				
	j. International Operations				
	k. Dispatch/Flight Following				
	l. Mass & Balance				
	m. Transportation of Dangerous Goods (TDG)				
	n. MEL/CDL				
	o. Flight Planning				
	p. Deicing/Anti-Icing				
	q. Carry-On Baggage				
	r. Exit Seating				
	s. Aircraft cargo loading manuals and specific cargo handling manuals				
	t. Station Operations Manual				
	3. Training Manuals/Programs/ Procedures (as applicable):				
	a. Flight Crew Training				
	b. Cabin Crew Member Training				
	c. Dispatch/Flight Following Training				
	d. Maintenance Training				

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	e. Ground Personnel				
	f. Destination/Alternate Aerodrome Analysis				
	4. Other Inspections/Reviews (as applicable):				
	a. Aircraft Conformity				
	b. Operational Control (Lease Agreements & Doing Business As (DBAs)				
	c. Cargo Evaluations				
	d. Service/Contract Agreements				
	e. Exemption/Waiver Requests				
	f. Mass and Balance Training				
	g. Cargo Loading and Handling Training				
	h. Ground Handling Procedures Training (if new aircraft or station)				
	5. Emergency Evacuation Demonstration Plan (as applicable)				
	6. Ditching Demonstration Plan (as applicable)				
	7. Notify GACA management of proving/validation flight dates, times, locations, etc.				
	8. Make Test Team member assignments				
	9. Coordinate: Security procedures and training				

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	10. Ensure Administrative requirements e.g., passport, visas, country clearance(s), travel authorization				
	11. Issue OpSpecs				
	12. Update master GAR record				

**NOTE:** During initial operator certification the above manuals/programs may have already been reviewed

**PHASE FOUR. INSPECTION AND DEMONSTRATION**

GAR CODE		INSP.'S INITIAL	DATE OBJECTIVE ACHIEVED	NOTES
	1. Ensure proper economic authority			
	2. Ensure proper fees have been paid			
	3. Emergency Evacuation Demonstration (as applicable)			
	4. Ditching Demonstration (as applicable)			
	5. Proving and/or Validation Flight			
	a. Table-top Demonstrations			
	b. Flight Preparation			
	c. Preflight			
	d. En Route			
	e. Post Flight			
	f. Applicant Recordkeeping			
	5. Validation Testing			

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	a. Table-top Demonstrations			
	b. In-depth review of:			
	(1) Applicant's proposed procedures			
	(2) Training Programs			
	(3) Manuals			
	(4) Facilities			
	(5) Maintenance Programs			
	6. Update Master GAR record			

**PHASE FIVE. APPROVAL/DISAPPROVAL**

GAR CODE		INSP.'S INITIAL	DATE	NOTES
	1. Final Economic Authority (if applicable)			
	2. PIs Approve/Issue OpSpecs			
	3. Letter of Disapproval (if applicable)			
	4. Test Team – Complete individual GAR records			
	5. CPM complete/close Master GAR			

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#### CHAPTER 17. PROVING AND VALIDATION TESTS FOR PARTS 121 AND 135

##### Section 3. Proving Test Requirements

**4.17.3.1. GENERAL.** Each applicant must demonstrate the ability to operate safely by conducting proving tests in accordance with the operating, maintenance, aircraft dispatch and flight release requirements of the General Authority of Civil Aviation Regulation (GACAR) Part 121 or 135, as applicable. Proving tests must be conducted in a manner that closely simulates the conditions that will apply after the General Authority of Civil Aviation (GACA) grants approval.

**A. Types of Flights.** The only types of flights that are acceptable to the President and can be credited towards proving test requirements are:

- 1) *Representative En-Route Flights.* Conduct representative en-route flights in compliance with Part 121 or 135 (as applicable) and other rules, including GACAR Part 109 regarding the transportation of dangerous goods (TDG), and all applicable GACA security regulations.
- 2) *Ferry Flights.* Ferry flights may be credited towards proving test requirements, provided crew members and initial cadre check pilot have completed applicable proficiency, competency, and type rating checks. Line checks and Operating Experience (OE) may be accomplished on proving flights.
- 3) *Training Flights.* Training flights may be credited toward proving test requirements, provided crew members are undergoing training according to the applicant's initially approved flight training curriculum. A qualified aviation safety inspector (Inspector) (Operations) must observe all training flights for the applicant to receive credit.
- 4) *Positioning Flights.* A positioning flight is a flight conducted to move an airplane over a non-representative route, such as from the aircraft factory to the applicant's main base. Notwithstanding other minimum proving flight requirements, positioning flights may be credited toward total proving flight time.

**NOTE:** See Section 5, Proving Tests: The Demonstration Phase, Paragraph 4.17.5.5 for additional guidance pertaining to proving flights conducted without an Inspector

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(Operations).

**NOTE:** Before an applicant may conduct these above-mentioned flights, the test team must be satisfied that the applicant's Phase-Three review has been completed.

**B. Additional Requirements.** Applicants must conduct flights in accordance with the following, as applicable:

- Part 121 or 135 operations manual
- Part 121 or 135 inspection or maintenance programs
- Minimum equipment list (MEL)
- Flight control requirements (dispatch or flight following) of Part 121 or 135
- Operations and maintenance recordkeeping requirements of Part 121 or 135

**4.17.3.3. PART 121 PROVING TEST REQUIREMENTS.** Requirements for Part 121 proving tests (GACAR §§ 119.39, 121.221 and 121.225) include, but are not limited to:

**A. Initial Aircraft Proving Tests.** No person may operate an aircraft before proven for use in a kind of operation under GACAR Part 121 unless an aircraft of that type has, in addition to the aircraft certification tests, at least 100 hours of proving tests acceptable to the President, including a representative number of flights into en route aerodromes. The President may reduce the requirement for at least 100 hours of proving tests if the President determines a satisfactory level of proficiency has been demonstrated to justify the reduction. At least 10 hours of proving flights (not reducible) must be flown at night.

**B. Proving Tests for Type of Aircraft and Kinds of Operation.** For each type of aircraft and each kind of operation, an applicant must conduct 50 hours of proving tests.

**C. Materially Altered Aircraft.** Applicants must conduct at least 50 hours of proving tests when the type of aircraft to be used has been materially altered in design. Examples of materially altering an aircraft design include:

- Installation of powerplants that are a different type from those originally installed on the

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aircraft for type certification (for example, reciprocating powered engines to turbine powered engines, or low bypass jet engines to high bypass jet engines)

- Alterations to the aircraft or its components that materially affect flight characteristics

**D. Proving Tests for Special Unscheduled Operations.** No operator may operate an aircraft if it has not previously proved an aircraft within the same aircraft group, as defined in GACAR § 121.5, in at least 25 hours of proving tests acceptable to the President including:

- If night flights are to be authorized, 5 hours of night time
- If IFR flights are to be authorized, five instrument approach procedures under simulated or actual conditions
- Entry into a representative number of en-route aerodromes as determined by the President

**4.17.3.5. PART 135 PROVING TEST REQUIREMENTS.** Requirements for Part 135 proving tests (§ 119.39 and Part 135, § 135.113) include, but are not limited to:

**A. Non-Turbojet Requirements.** For two-pilot operations under VFR, an applicant must conduct a minimum of 25 hours of proving tests if the applicant has not previously proven such an aircraft in Part 135 operations.

**B. Turbojet Requirements.** A minimum of 25 hours is required if the applicant has not previously proven a turbojet aircraft under Part 135 operations.

**C. Single-Engine Turbine-Powered Requirements.** At night or in instrument meteorological Conditions (IMC) if it has not previously proved a single engine turbine powered airplane in operations at night or in IMC in proving tests acceptable to the President.

**D. All Aircraft.** A minimum of 5 hours of night-flying time (if applicable), 5 instrument approach procedures (IAP) (simulated or actual) (if applicable), and entry into representative number of en-route aerodromes (determined by the President) are required.

**4.17.3.7. REDUCTION/RELIEF FROM PROVING TEST REQUIREMENTS.** GACAR § 121.221 authorizes the GACA to grant a reduction of proving test hours based on experience and/or performance factors. GACAR §§ 121.225 and 135.113 allow the President to provide relief from that

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specific GACAR if he finds that special circumstances make full compliance with that GACAR unnecessary. See Section 7, Request for Reduction of Proving Test Hours, for further direction and guidance for processing requests from applicants concerning reductions in proving test hours.

**4.17.3.9. REPRESENTATIVE NUMBER OF FLIGHTS INTO AERODROMES.** GACAR §§ 121.221, 121.225 and 135.113 require an applicant to conduct a representative number of proving flights into en-route aerodromes. These are aerodromes that the applicant plans to use in scheduled operations or is likely to use in unscheduled operations.

**A. Aerodromes Locations.** Representative aerodromes must be within the applicant's proposed areas of operations. If an applicant plans to conduct overseas and/or international operations, the applicant must conduct proving flights into domestic, overseas, and/or international areas.

**B. Determining Representative Aerodromes.** The GACA test team must determine what constitutes a representative aerodrome or area of operation (and the number of representative aerodromes and areas). This determination should include a consideration of factors pertinent to the proposed type of operation. Some of these factors are the same as those considered when approving a reduction to the proving test hours. These considerations are discussed in Section 7, of this Chapter.

### **4.17.3.11. CARRIAGE OF PASSENGERS AND/OR CARGO.**

**A. Carriage of Revenue Passengers.** The carriage of revenue passengers on proving flights is prohibited by GACAR §§ 121.221(f), and 135.113(d).

**B. Carriage of Revenue Cargo.** Per GACAR § 121.221(f), the President may authorize the carriage of revenue cargo or mail for a GACAR Part 121 applicant that has appropriate GACA economic authority. Applicants seeking GACA certification that do not have appropriate economic authority are not permitted to carry revenue cargo or mail; however, the carriage of company or simulated cargo is encouraged. It is GACA policy to encourage the carriage of cargo or mail on representative en route proving flights, when possible, since the carriage of cargo or mail allows for a more comprehensive test of the applicant's capabilities.

**NOTE:** Carriage of revenue cargo or mail during proving flights to or from foreign countries may only be conducted if there is a bilateral agreement with that foreign country, the flights are in accordance with the terms of the bilateral agreement and the applicant has (1) Saudi Arabian economic authority and (2) an authorization from the GACA.

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#### CHAPTER 17. PROVING AND VALIDATION TESTS FOR PARTS 121 AND 135

##### Section 4. Planning the Proving Test

###### 4.17.4.1. APPLICANT'S PLAN FOR PROVING TESTS .

**A. Proving Test Plan.** An applicant must submit a proving test plan at least 30 days in advance of any in-flight demonstration (including training or ferry flights) that the applicant desires to have credited toward the proving test requirements. Any subsequent change to the plan must be coordinated with the test team. The plan must contain at least the following information:

- Identification of the company coordinator who will serve as the primary proving test spokesperson
- A detailed schedule of all proposed flights, including dates, times, and aerodromes to be used (The schedule should clearly differentiate which flights will be conducted for training, ferry, or representative en route flights.)
- A list of names and positions of the crew members who will be participating on each flight
- A list of names, titles, and company affiliations of non-crew member personnel whom the applicant intends to have on board each flight
- Any other information that the test team determines is necessary to properly plan and conduct the proving flight

**NOTE:** It is General Authority of Civil Aviation (GACA) policy that 50 percent of the scheduled proving flight hours consist of representative en-route flights over routes and into aerodromes which the applicant intends to serve.

**NOTE:** See Figure 4.17.4.1, Sample Proving Test Plan.

###### B. Training Program and Aircraft Maintenance Records.

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1) The applicant should be prepared to present personnel training records for, but not limited to:

- Crew member training records
- Aircraft maintenance records
- Maintenance personnel training records
- Aircraft ground handling personnel training records
- Cargo loading and handling records
- Mass and balance records

2) Before initiation of proving tests, aviation safety inspectors (Inspectors) may request copies of records as an attachment to the plan for evaluation.

**4.17.4.3. APPLICANT'S PLAN FOR REQUESTING REDUCED PROVING TEST HOURS.** If a GACAR Part 121 (not including special unscheduled operations) applicant requests a reduction from the General Authority of Civil Aviation Regulation (GACAR) required number of proving test hours, the request must be made by letter. The letter must transmit the applicant's plan, which is described in the previous paragraph, and it must include the additional information specified in Section 7 of this chapter.

### **4.17.4.5. GACA PLANNING FOR PROVING TESTS.**

**A. Early Planning.** Development and implementation of the GACA's plan for observation and evaluation is of crucial importance to any proving test. The GACA test team should begin planning in Phase One of the proving test process. GACA planning should be completed as soon as possible after the inspection team receives the applicant's plan.

**B. Initial Review.** The test team must review the applicant's plan initially to determine if the appropriate documentation has been submitted. The plan must contain a realistic proposal that will permit the GACA to adequately observe and evaluate the applicant's overall abilities. This review should be accomplished within five working days after receipt of the applicant's plan. Based on the results of this initial review, the GACA test team must take one of the following

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actions:

- 1) *Accept the Plan.* If the applicant's plan is feasible, is accompanied by supporting documentation, and if it satisfies regulatory and GACA policy requirements, the certification project manager (CPM) should verbally notify the applicant. Any changes should be mutually agreed upon at this time. If the applicant's plan includes a request for reduction from the required number of proving test hours, formal acceptance by letter must follow. This letter must include a statement verifying that a reduction to the appropriate regulations is granted.
- 2) *Return the Plan with Explanation.* If the applicant's plan lacks appropriate documentation, or does not satisfy regulatory or GACA policy requirements, the GACA test team must return it to the applicant as soon as possible. A letter that briefly describes the principal reasons for the plan's rejection should accompany the plan.

**NOTE:** When the test team denies a request for reduction, the denial must be done by letter. This letter should contain any suggestions the team may have that would make the plan acceptable.

**4.17.4.7. OTHER PROVING TEST PARTICIPANTS.** GACAR §§ 121.221(f), 121.225(b) and 135.113(d) limit the individuals who can participate in the in-flight portion of the proving tests to those who are required by the applicant to conduct the tests, and to those designated by the President.

**A. Kingdom of Saudi Arabia (KSA) Government Participants.** During the demonstration phase, an applicant exercises all aspects of its operation, such as flight control, communications, flight planning, non-routine maintenance, and minimum equipment list (MEL)/ Configuration Deviation List (CDL) program control. It is essential that this phase be free from distractions created by nonessential personnel. The test team may authorize the participation of any government or contractor employee, including those from other agencies. These personnel should be limited to those having specific tasks to perform and to Inspectors accomplishing on-the-job training (OJT).

**B. The Applicant's Participants.** Many situations occur during proving flights that require decisions by the applicant's supervisory personnel to correct deficiencies observed during the flights. Therefore, the applicant's participants should include:

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- Applicable crew members (i.e., pilots, flight engineers, cabin crew members, check pilot)
- Directors of operations, maintenance, and quality control (if applicable)
- Supervisory personnel needed to act on behalf of the applicant if actions are required to resolve discrepancies (e.g., in-flight management representatives)

**C. Other Personnel.** Other personnel, such as representatives of engine and aircraft manufacturers, may be authorized to participate if their presence materially enhances the process.

**4.17.4.9. COORDINATION.** During the development of the GACA plan to conduct proving tests, the GACA CPM is responsible for coordinating all parts of the proposed tests. The applicant's representatives and crew members and GACA participants must understand and agree on which tasks must be accomplished to show compliance with regulatory requirements. The CPM notifies the Office Manager of proving flight dates, times, and locations. When planning proving tests, the test team should use Figure 4.17.2.1, General Purpose Proving and Validation Test Job Aid, found in Section 2.

**4.17.4.11. PREDEMONSTRATION TEST MEETING (GACA TEST TEAM).** The CPM conducts as many pre-demonstration test meetings as necessary to accomplish the following:

**A. Provide Schedules and Assignments.** The GACA CPM provides specific team members with schedules and assignments for the proving flights, including:

- Flight times
- Locations
- Inspections
- Reporting requirements

**B. Proving Test Scenarios.** The test team establishes in-flight and ground scenarios, simulated emergencies, and other means of testing the ability of crew members and the applicant to cope with actual operational contingencies independently and safely. Such scenarios are effective when evaluating the applicant's overall and specific abilities. The scenarios, and their results, will be retained and become part of the permanent record of the certification and/or request.

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**NOTE:** See Figures 4.17.4.4, Proving Flight Test Work Sheet.

**NOTE:** Inspectors may wish to attach a copy of the company procedures for quick reference.

- 1) All team members must clearly understand in-flight and ground scenarios in terms of individual roles and responsibilities. In addition, the scenarios should be multi-disciplinary in nature, i.e., involve flight operations, airworthiness, cabin safety, operational control, and/or stations issues, or any combination of these. Initiate only one scenario at a time. The CPM must ensure that the applicant is not encumbered with so many simulated scenarios that a proper evaluation of its proposed routine operation is inhibited. Scenarios should focus on areas of weakness found during phases three and four.
- 2) Since the primary purpose of proving flights is to ensure basic compliance with the regulations and safe operating practices during routine operations, the CPM should not permit compound emergency scenarios to occur. When other agencies, such as air traffic services (ATS) and aerodrome authorities need to be involved for safety and/or security reasons, the CPM ensures that all scenarios are well coordinated. If an actual emergency occurs, all simulated scenarios must be terminated.
- 3) The following examples of typical scenarios may be useful for evaluating the applicant's capabilities:
  - a) Diversion to alternate aerodromes for reasons such as weather or maintenance. This scenario tests the applicant's communications, maintenance, and other operational control capabilities.

**NOTE:** If a planned diversion is anticipated in international airspace, include the note: "diversions for training purposes may be necessary" in the remarks section of the flight plan. A telephone call to the controlling ATS facility(s) is recommended prior to departure. In addition, if and when the diversion occurs, ensure that flight crews use the following text: "we are diverting for a simulated emergency that is part of a training exercise" in initial communications with ATS.

b) MEL or CDL situations. These scenarios test the crew members' understanding of specific operational limitations and the applicant's operations and maintenance procedures. For example, dispatching with simulated inoperative generators overwater tests the applicant's ability to comply with the operational and maintenance

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provisions of the minimum equipment list ( MEL) or configuration deviation list (CDL).

c) Performance problems. These scenarios require flight crew and operational control personnel to demonstrate competency and knowledge of items, such as aircraft performance, aerodrome analysis programs, and alternative company procedures. For example, simulating an inoperative antiskid or thrust reverser while operating on contaminated runways (ice, slush, or snow) tests the applicant's ability to deal with performance issues.

d) *Security and/or hazardous cargo situations.* These scenarios require the flight crew and other applicant company personnel to function in accordance with established company dangerous goods and security procedures and GACA regulations.

**NOTE:** Hijack or other security-related scenarios are prohibited during proving flights. Flight crew knowledge and company procedures must be examined by GACA Inspectors through other methods. The applicant's anti-hijack program is not exercised during proving flights.

e) *Situations that exercise dispatch or flight-following procedures.* These scenarios test communications, Notices to Airmen (NOTAM), Special Flight Advisories, weather information dissemination, and other operational control issues. An effective means for testing these capabilities is to position an Inspector who has specialized dispatch knowledge in the operator's operational control facility (for GACAR Part 121), at a prearranged time to initiate a scenario such as adverse destination weather that would require a diversion. This action tests the communications and weather reporting capability of the facility and also the applicant's procedural contingencies as demonstrated by the flight crew.

**NOTE:** Evaluation of flight following procedures for Part 135 are typically conducted by an Inspector (Operations) either from an aircraft en-route or during ground operations.

f) *Maintenance scenarios.* The test team should plan a simulated maintenance problem, however minor, at any location into which the operator operates. This tests the applicant's ability to communicate and resolve problems that flight crews may experience (see GACAR § 121.1193). Maintenance scenarios should be flexible enough to accommodate any real maintenance problems that could arise during a proving flight.

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g) *Simulated aircraft emergencies.* These scenarios test the crew member's knowledge and competency in handling emergency situations in accordance with the applicant's procedures. They also test applicant communications, maintenance, and other operational capabilities. Examples include:

1. Simulated engine failure. An Inspector will not, under any circumstances, require an actual engine shutdown.
2. Simulated incapacitated passengers in need of immediate medical assistance.
3. Simulated lavatory fire.
4. Simulated loss of pressurization.
5. Simulated landing gear extension or retraction problems.
6. Simulated auxiliary power unit (APU) inoperative (e.g., inoperative air flow, inoperative electric output).
7. Cabin safety scenarios. Cabin crew members play a very important role in proving runs. Therefore, in-flight policies and procedures should be represented by appropriate, applicable cabin scenarios. Possible examples include:
  - Carry-on baggage
  - Exit seating
  - Incapacitated cabin crew member
  - Passenger smoking in cabin or lavatory
  - Passenger noncompliance
  - Intoxicated passenger

**NOTE:** Under no circumstances should an aircraft divert from a planned route, altitude, or speed without prior coordination with ATS, unless an actual emergency exists and it

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precludes such prior coordination with ATS.

**4.17.4.13. ISSUANCE OF LETTER OF AUTHORIZATION (LOA).** Until the final phase is completed and the operation specification (OpSpec) approval is issued, an operator must be issued an LOA to conduct the following:

**A. Proving Flights.** Per GACAR § 119.39(c), all GACAR Part 121 and 135 applicants must have received an LOA and draft OpSpecs before proving tests may commence. See Figure 4.17.4.2, Proving Flight Letter of Authorization.

**NOTE:** The applicant should submit a letter of request at least 10 business days prior to the first proposed flight.

**B. Special Areas of Operation.**

1) Per GACAR §§ 91.405, 91.407 and 91.409, all applicants must be authorized by the President and operate in accordance with the their authorized procedures before operating in Performance-Based Navigation, Minimum Navigation Performance Specifications (MNPS) or Reduced Vertical Separation Minimum (RVSM) airspace.

**NOTE:** See Figure 4.17.4.3, Special Areas of Operation Letter of Authorization.

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**Figure 4.17.4.1. Sample Proving Test Plan**

Date

Mr. Inspector

Certificate Project Manager

GACA SS&AT

Post Office Box 12345

Jeddah, Saudi Arabia 74321

Dear Mr. Inspector:

Enclosed for your consideration is the First Jet Airlines, Inc. Proving Test Plan for the Boeing 767-300.

The plan has been formatted with the “P” series flight numbers indicating a proving test flight.

The plan assumes that all flights will be operated as normal line flights. Each flight will consist of fueling, baggage handling, passenger handling, and aircraft servicing as required by the existing circumstances. Each crew member will perform their respective duties per First Jet Airlines, Inc. standard operating policies and procedures. Any simulated, abnormal, or emergency situations will be provided by General Authority of Civil Aviation (GACA) authorized personnel. Any simulated or actual abnormal or emergency situations that may occur will be handled in accordance with First Jet Airlines, Inc. approved Company Flight Manual and standard operating procedures.

**I. Company Coordinator:** Jack Simpson

**II. Proving Test Schedule**

A. Representative en route flights 50:07

B. Non-en route segments

1. Ferry flights: None

2. Training flights: None

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C. Maintenance test unit: None

**Flight Schedule:**

**ABC**

**Date:**

<b>Flt #</b>	<b>Dep. City</b>	<b>Dep. Time</b>	<b>Arr. City</b>	<b>Arr. Time</b>	<b>Seg. Time</b>	<b>Act. Time</b>	<b>Total Time</b>
101P	ABC	11:30	DEF	12:41	1:11	_____	1:11
102P	GHI	13:30	JKL	14:43	1:13	_____	2:24

**Total time scheduled: Hrs. & Min. 2:24**

**JKL**

**Date:**

<b>Flt #</b>	<b>Dep. City</b>	<b>Dep. Time</b>	<b>Arr. City</b>	<b>Arr. Time</b>	<b>Seg. Time</b>	<b>Act. Time</b>	<b>Total Time</b>
201P	JKL	11:30	MNO	12:41	1:11	_____	1:11
202P	MNO	13:30	PQR	14:43	1:13	_____	2:24
203P	PQR	16:30	STU	17:20	:50	_____	3:14

**Total time scheduled: Hrs. & Min. 3:14 Cumulative time scheduled: Hrs. & Min. 5:38**

**Total Hours: Hrs. & Min. 50:07**

**III. Flight Crew Members:**

- 1.
- 2.
- 3.
- 4.
- 5.

**Cabin Crew Members:**

- 1.
- 2.
- 3.
- 4.
- 5.

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**IV. Non-Flight Crew members**

**Name/Position**

1. \_\_\_\_\_ Accountable Executive
2. \_\_\_\_\_ SMS Responsible Manager

Your comments and consideration in this matter are greatly appreciated.

If I can be of assistance, please call me at (966) 2-555-3825 or cell (966) 2-555-4403.

Sincerely,

Director of Operations  
First Jet Airlines, Inc.

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### Figure 4.17.4.2. Proving Flight Letter of Authorization

[GACA Letterhead]

[Date]

[Requestor]

XYZ Airlines, Inc.

Anywhere, Saudi Arabia, postal code

Dear Mr. Requestor:

#### Letter of Authorization

As requested in your letter of [date], [name of company] is authorized to operate [aircraft make/model and registration number] in compliance with the General Authority of Civil Aviation Regulation (GACAR) § 121.221. [Name of company] is authorized to conduct for the purpose of training flights, proving flights, and other flights associated with certification under the requirements in accordance with the provisions of GACAR § 119.39(c) and § 121.221. All proving tests must be conducted under the appropriate operating and maintenance requirements of GACAR Part 121 that would apply if the applicant were fully certificated. Only passengers' incidental to the business of the company may be carried under the provisions of this letter.

During the course of any operations conducted under the authority of this letter of authorization (LOA), the company must demonstrate full compliance with and an ability to operate in accordance with Part 121, issued draft operations specifications (OpSpecs), and the Approved Proving Flight Plan. In the event of actual or simulated equipment malfunction(s) [name of company] must operate in accordance with the draft minimum equipment list (MEL).

The proving flights will begin on or about \_\_\_\_\_ and terminate on or before \_\_\_\_\_, or otherwise upon satisfactory completion of all required tasks or when the President determines that [name of company] has demonstrated operational qualifications.

In addition, these proving flights may be suspended or terminated when the President determines that the public interest in air safety so requires. [Name of company] proving flights may be suspended or terminated if any of the following conditions occur:

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- Violation of any section of the GACARs
- Noncompliance with draft OpSpecs
- Unapproved deviation from Approved Proving Flight Plan (except actual emergency)
- Inadequate or incomplete training of required crew member or maintenance personnel
- Failure to operate in accordance with established company manual procedures
- Failure to meet three consecutive scheduled takeoff times (if the delay is not the direct result of a scenario generated by the GACA)
- Inability to detect and correct operational and/or maintenance deficiencies

Lack of qualified support personnel to conduct operations

The above conditions are illustrative and shall not be considered an exclusive listing of the basis for suspension or termination of proving flights. Proving flights may be suspended or terminated at any time when deemed appropriate by the President. The President shall provide written notice to [Name of company] with the reasons for suspension or termination of such flights within five (5) working days.

A copy of this letter must be carried on the above numbered airplanes during the operations specified.

Signed,

Manager, Flight Operations Division

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### **Figure 4.17.4.3. Special Areas of Operation Letter of Authorization**

This letter constitutes approval for the named aircraft to operate in the Minimum Performance Specification Airspace (MNPS), airspace designated with a Performance-Based Navigation specification, and/or Reduced Vertical Separation Minimum (RVSM) airspace or to conduct oceanic flight by the authorized operator or crew listed under the conditions and limitations below.

Aircraft make and model \_\_\_\_\_ HZ-Number \_\_\_\_\_

Aircraft serial number \_\_\_\_\_ Aircraft color \_\_\_\_\_

Aircraft base of operations (city postal code)  
\_\_\_\_\_

Name of aircraft owner/operator \_\_\_\_\_

Crew training conducted by \_\_\_\_\_

Print name of person responsible for crew operations or agent for service (must be a Saudi Arabian citizen) \_\_\_\_\_

Signature of person responsible for crew operations or agent for service  
\_\_\_\_\_

Address \_\_\_\_\_

City, postal code \_\_\_\_\_

THIS AUTHORIZATION IS SUBJECT TO THE CONDITIONS THAT ALL OPERATIONS CONDUCTED WITHIN MNPS AIRSPACE ARE IN ACCORDANCE WITH THE GENERAL AUTHORITY OF CIVIL AVIATION REGULATION (GACAR) § 91.407 AND THE FLIGHT RULES CONTAINED IN INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) ANNEX 2, AND THAT ALL OPERATIONS OUTSIDE OF THE KINGDON OF SAUDI ARABIA COMPLY WITH GACAR § 91.475 AND ANNEX 2. THE PERSON RESPONSIBLE FOR CREW OPERATIONS OR AGENT FOR SERVICE MUST ACCEPT RESPONSIBILITY FOR COMPLYING WITH THE STATED REGULATIONS BY SIGNING THIS DOCUMENT. THIS DOCUMENT IS

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CONSIDERED INVALID UNTIL SIGNED. IF THE PERSON SIGNING THIS DOCUMENT RELINQUISHES RESPONSIBILITY, CHANGES MAILING ADDRESS, OR THE AIRCRAFT CHANGES OWNERSHIP OR BASE OF OPERATION, THIS LETTER BECOMES INVALID AND THE SIGNEE SHOULD IMMEDIATELY NOTIFY THE GACA OF THE CHANGE. LOAS CAN BE RENEWED VIA A LETTER OR FAX REQUEST SUBMITTED AT LEAST 30 DAYS PRIOR TO THE EXPIRATION DATE IF NO CHANGES HAVE BEEN MADE. IF ANY CHANGES HAVE BEEN MADE, APPLICATION FOR A NEW LOA MUST BE MADE IN THE SAME MANNER AS THAT REQUIRED FOR THE INITIAL LOA.

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[Manager, Flight Operations Division signature]

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[Signature of applicant responsible for crew operations]

**FOR GACA USE ONLY (To be completed by office)**

This approval is for: MNPS only \_\_\_\_\_ MNPS and RVSM\_\_\_\_\_

[enter Inspector's initials] [enter initials OR "N/A"]

Authorization Number \_\_\_\_\_

Aircraft limitations (if applicable) \_\_\_\_\_

Date of Issuance \_\_\_\_\_ Expiration Date \_\_\_\_\_

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**Figure 4.17.4.4. Proving Flight Test Work Sheet**

Proving Flight Test Work Sheet					
Applicant Name	Departure	Arrival			
	<b>Location</b>	<b>Location</b>			
<b>Flight Number</b>	<b>Time</b>	<b>Time</b>			
<b>Scenario</b>					
<b>Assignments</b>					
<b>Initiation</b>					
<b>Objective</b>					
<b>Standards</b>					
<b>Termination</b>					
<b>Comments</b>					
<b>Block Time</b>		<b>Flight Time</b>		<input type="checkbox"/> Day	<input type="checkbox"/> Night
<b>Date</b>	<input type="checkbox"/> Sat	<input type="checkbox"/> Un-sat	<b>Signature</b>		

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#### **CHAPTER 17. PROVING AND VALIDATION TESTS FOR PARTS 121 AND 135**

##### **Section 5. The Demonstration Phase**

**4.17.5.1. GENERAL.** The demonstration phase consists of the observation and evaluation of the applicant by General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) during tabletop exercises and proving flights. The proving flight portion of the observation and evaluation consists of en route flights and other acceptable flights. These flights are described in more detail in this section.

##### **4.17.5.3. TABLETOP EXERCISES.**

**A. Purpose.** All General Authority of Civil Aviation Regulation (GACAR) Part 121 and 135 applicants must satisfactorily complete tabletop exercises before conducting proving flights. These exercises will be conducted to determine that the applicant's systems and personnel perform at a level that justifies conducting proving flights. These exercises should not be a ground-based duplication of the planned proving flight exercise.

**NOTE:** The tabletop exercise process for validation testing is described in Section 8, Validation Test Requirements.

**B. Developing a Test Plan.** When developing a test plan for tabletop exercises, consider the following elements:

- 1) The scenarios should involve Operations, Airworthiness, cabin safety, and station issues. They should also include scenarios that relate to manual programs required by operations specifications (OpSpecs).
- 2) The certification project manager (CPM) presents the scenarios. The CPM will utilize other members of the team, as appropriate, during the scenarios.
- 3) The use of "real world scenarios" enables the applicant's team to respond through the processes, policies, practices, and procedures documented in their manual.
- 4) The effectiveness of interfaces is evaluated during the scenarios by allowing natural event

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progression with the management personnel having responsibility and/or authority for the associated elements of that scenario.

- 5) As part of the planning process, the team members develop a recommended minimum of 20 scenarios. They base these scenarios on their knowledge of the applicant's systems gained during the manual review.
- 6) For GACAR Part 135 applicants, the number of scenarios is at the discretion of the CPM.
- 7) The CPM selects a minimum of 10 scenarios to use in the exercise with an additional 5 as backups. Document each on the Tabletop Scenario Worksheet (Figure 4.17.5.1).
- 8) Using the processes, policies, procedures, and practices contained in the applicant's manual, the applicant's personnel leads the GACA team through each scenario.
- 9) After each scenario is completed, the applicant's team debriefs the GACA test team on their perceptions of the scenario.
- 10) After the applicant's debriefing, the GACA test team debriefs the applicant's performance on that scenario.
- 11) If the performance during any scenario is unsatisfactory, a different scenario must be presented using the same high-risk indicators and areas of concern.
- 12) The CPM provides a list of concerns to the applicant.
- 13) If the applicant fails more than one scenario, the exercise will terminate. The applicant may reschedule the exercise.
- 14) If the applicant fails a similar scenario three times, the CPM terminates the process until such time as the applicant corrects the identified concerns or discrepancies.
- 15) The applicant must successfully complete all scenarios presented by the test team in order for the application process to continue.
- 16) The CPM documents the results of each scenario on a Table Top Scenario Worksheet (See Figure 4.17.5.1).

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17) Unsatisfactory scenarios may be repeated at the discretion of the test leader.

**4.17.5.5. CONDUCT OF EN-ROUTE FLIGHTS.** En-route flights (representative en route) should closely simulate the routine line operations that the applicant proposes to conduct.

**A. Inspection Team Composition.** The onboard team of GACA Inspectors should include an Inspector (Operations), qualified on the specific aircraft, who directly observes the flight crew and in-flight events and reports those observations. An Inspector knowledgeable in dispatch procedures should also be included to observe the operational control functions. The majority of en-route flights should also be observed by an Inspector (Airworthiness) on board the aircraft. In addition to the in-flight activities, Inspectors must also evaluate flight initiation, servicing and unscheduled maintenance, and flight termination activities. While representative en route flights are being conducted, other Inspectors should observe the applicant's activities at appropriate ground facilities, such as operational or maintenance control centers. An Inspector should serve as the focal point for all in flight scenarios involving cabin crew members (CCMs).

**NOTE:** For flights involving repositioning of Inspectors for proving or validation ground scenarios (i.e., flights that do not include in-flight scenarios), a qualified Inspector (Operations) does not need to be onboard the aircraft, provided the flight crew is type-rated, current, and has completed all training requirements, as applicable for the type of operation. Such flights are considered incidental to the proving/validation tests and considered advantageous to both the GACA and operator.

For unique situations in which an operator must conduct proving flights in an aircraft with only one jump seat and no passenger seats (e.g., cargo-configured aircraft), a qualified Inspector (Operations) must conduct all in-flight scenarios. The principal operations inspector (POI) should thoroughly review the applicant's proving test plan to ensure that all GACA disciplines have the opportunity to conduct sufficient testing. Other forms of testing can be accomplished by table-top demonstrations and pre- or postflight scenarios.

All GACA participants conducting the proving test must review the carrier's operation, operations manual, and the proving test plan in order to report deficiencies in any of these areas. It is desirable to have the POI included as part of the in-flight proving test team, but on space-limited flights where the POI is not the qualified Inspector (Operations), the qualified Inspector (Operations) should have seating priority in order to facilitate the in-flight scenarios.

Once the qualified Inspector (Operations) has completed the in-flight scenarios associated with

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proving flights, the Inspector (Airworthiness) should have an opportunity to observe normal flight deck operations from the flight deck jump seat. When an Inspector (Airworthiness) is occupying a flight deck jump seat, no in-flight scenarios may be conducted. The additional Inspector observations should be planned so additional flight segments are not required of the operator.

**B. Pre-demonstration Test Briefing with Applicant.** The CPM conducts briefings with the applicant daily, or as necessary to establish what the test team expects the applicant to accomplish during each proving test. Briefings should include at least the following items:

- Purpose of the proving test
- Status of the Inspector in the jump seat
- Status of the onboard team of Inspectors (they are treated as passengers)
- Changes in status of passenger to GACA Inspector when a GACA credential is revealed
- Procedures for initiating simulated scenarios, see D1) below, and what action is expected from the applicant
- Procedures for reacting to an actual emergency during the proving test
- Copies of flight plans, load manifests, and other documents that are expected and that should be provided
- Procedures for treating or terminating maintenance discrepancies
- Debriefing at the conclusion of each day unless major problems require it sooner. (Major discrepancies must be resolved before the proving test may resume the following day.)

### C. Proving Flight Protocol.

- 1) Inspectors may play the role of a passenger. The Inspector (Operations) assigned to the flightdeck is always in an Inspector role.
- 2) Inspectors observe normal and routine operations, such as preflight duties, carry-on baggage, correct announcements, briefing of passengers at emergency exit seats, and/or crew

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signals.

- 3) Inspectors use Proving Flight Test Scenario Worksheets to document the results of each scenario.
- 4) Inspectors perform as passengers in “real life scenarios,” and should act the part, see D1) below.
- 5) Inspectors should discreetly communicate with each other when a scenario is about to begin.
- 6) Inspectors should not touch or operate any emergency equipment onboard.
- 7) Company personnel and/or Inspectors should not actually position engine controls, switches, etc. to initiate, or in response to, a scenario.
- 8) In the case of emergency equipment malfunction scenario, a note will be taped to the equipment, a note given to the crew member, or the Inspector will verbally inform the crew member.
- 9) One Inspector will be assigned to end each scenario. This information should be included on each Proving Flight Scenario Worksheet.
- 10) If an actual emergency situation occurs, the test scenario will be terminated.
- 11) Do not discuss scenario results with the applicant. The test team will discuss the results of each scenario as a team at the end of the day, and then the applicant will be briefed.
- 12) Crew members should use a copy of an actual aircraft logbook page to record scenarios.
- 13) The CPM (or designee) carries the flight schedule, crew member names, scenario worksheets, and cards, and coordinates with the Inspectors onboard. In the event the CPM (or designee) cannot be onboard for a particular day, he will designate another team member to act in that capacity.

### **D. Determining Applicant Competency.**

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1) The GACA test team may initiate a scenario using any of the following methods:

- A note containing specific instructions handed to an employee
- A “passenger” engaging in some activity
- Verbal instructions given by an GACA Inspector who is holding his credentials where they are visible

**NOTE:** In some situations it is impractical to hand the applicant a note or give him verbal instructions, such as in scenarios where a passenger stands up while the aircraft is taxiing, appears to be disruptive, or uses a cell phone prior to takeoff. In order to test the CCM's knowledge and ability to follow procedures, these types of scenarios should be acted out. It is up to the team to determine how each scenario is presented.

2) The test team's plan for inspecting and evaluating an applicant's competency during the en route segment should include scenarios and other testing mechanisms designed to test the effectiveness of the applicant's:

- Flight crew
- Cabin crew
- Aerodrome/station facilities
- Operational control
- Company procedures

a) *Flight crew.* The test team evaluates the competency and ability of the flight crew throughout the en-route segment. Examples of areas to inspect and evaluate are:

- Flight crew qualification
- Aircraft performance (including flight characteristics)
- Aircraft Flight Manual (AFM) limitations

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- Aircraft normal, abnormal, and emergency procedures
- Aircraft systems and equipment
- Aerodrome data (including knowledge of required runway lengths, field elevation, facilities, and gates or parking areas)
- Flight management and cruise control
- Company manuals and procedures
- Crew discipline, situational awareness (SA), and crew management
- Crew vigilance and collision avoidance procedures
- Knowledge of en route structure, long-range navigation procedures (if applicable), and unique en route and area-of-operation requirements
- Knowledge of Minimum Equipment List (MEL) and Configuration Deviation List (CDL) procedures
- Knowledge of, and competency in, departure and arrival procedures
- Air/ground communications with the company and also with air traffic service (ATS)
- Check pilot/check pilot performance and effectiveness
- Adequacy of aircraft training program as demonstrated by the flight crew
- Cabin crew and passenger briefings
- Knowledge of security requirements and procedures
- Crew Resource Management (CRM)
- Communication and coordination with station personnel

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b) *Cabin Crew.* The test team evaluates the cabin crew competency and ability during the en-route segment. Examples of areas to inspect and evaluate are:

- Competency in all normal procedures associated with their assigned positions
- Knowledge of emergency procedures (including evacuation, firefighting, pressurization problems, passenger illness or injury, baggage in the cabin, and exit seating)
- Knowledge of applicable manual procedures pertaining to duties and responsibilities
- Knowledge of procedures to follow when a crew member is incapacitated
- Knowledge of verbal and non-verbal communication procedures between the cabin and cockpit (such as the number of chimes indicating imminent takeoff or landing)
- Training program effectiveness
- Cockpit coordination (including crew and passenger briefings, communication and coordination with station personnel, CRM, and knowledge of security requirements and procedures)

c) *Aerodrome/Station Facilities.* The test team determines whether the aerodromes and the applicant's station facilities are adequate to support the specific aircraft and type of operation proposed by evaluating, at a minimum:

- Runways and taxiways
- Runway and taxiway lighting
- Approach lighting
- Navigational Aids (NAVAID)
- Gate, ramp, and loading area conditions (such as markings, congestion, and

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lighting)

- Station operations manuals, maintenance manuals, and facilities
- Ground crew qualifications and training (if applicable)
- Passenger enplaning and deplaning procedures
- Baggage and cargo loading
- Aircraft fueling and servicing
- Gate arrival and departure procedures and equipment

d) *Flight control, dispatch and flight-following centers.* At applicable locations, the GACA test team evaluates and inspects:

- Flight planning
- Dispatch and flight release procedures
- Aerodrome and route information collection and dissemination
- Driftdown and diversionary procedures
- Weather information collection and dissemination
- Dispatch and flight control personnel competency
- Communications capability within the company, with the aircraft, and with other agencies
- Load control (for example, the accuracy of the passenger count and the ability to convey mass and balance changes to and from the aircraft before takeoff)
- Scheduling
- Flight crew duty and rest time

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- Manuals
- High minimums captains
- Maintenance control (procedures and records)
- Flight crew briefings
- Initial check dispatcher (Part 121 only) competency check on initial cadre dispatchers (as applicable)

e) *Company procedures, programs, and interfaces.* Examples of company procedures, programs, and interfaces to inspect and evaluate are:

- Aircraft operations operational control
- Ground operations and maintenance personnel
- Fueling facilities and equipment
- Security (public protection and restricted articles)
- Adequacy of training programs
- MEL and CDL procedures
- Procedures for accomplishing unscheduled and scheduled maintenance
- Transportation of dangerous goods (TDG)
- Ability to conduct operations at unscheduled stops or alternate aerodromes
- Adverse weather requiring coordination between dispatcher, pilot, and CCMs,
- Carry-on baggage
- Exit row seating

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**4.17.5.7. CONDUCT OF OTHER FLIGHTS.** Other flights, such as training, positioning, or ferry flights, may be counted toward proving flight hours. GACA observation of these flights allows inspection of the applicant's training, maintenance, and other programs.

**NOTE:** All training flights that are to be credited toward the proving test requirements must be observed by a qualified Inspector (Operations).

**A. En-Route Training.** During the en-route segment, the company trains its initial cadre check pilot, instructors, and line crew members. Crew members also gain Operating Experience (OE) so that revenue operations may begin with minimum delay after certification. Since GACA Inspectors function as observers during this phase, it is not appropriate for them to require simulated in-flight scenarios that would either disrupt airman training or delay these flights.

**B. Cabin Crew Member (CCM) Training.** CCM training may be conducted on board flights when flight deck and CCM training goals are compatible.

**C. Dispatcher//Director of Operations (DO) Designated Personnel Training.** The applicant may conduct operations control personnel training in the operations control (dispatch) center while the applicant is conducting proving, validation, training, positioning, or ferry flights.

**4.17.5.9. COMPLETION OF THE EN-ROUTE SEGMENT.** The test team may conclude the proving flight in one of the following ways:

**A. Completion as Planned.** The applicant completes the planned proving flight schedule without significant change.

**B. Early Completion.** The tests may conclude sooner than planned when all test objectives have been met, and the applicant has demonstrated a repeated ability to conduct line operations in compliance with regulations and safe operating practices. The team should be satisfied that the applicant will continue to function in a satisfactory manner.

1) Before authorizing an early completion of the test, the team lead must take into account any flight hour reductions granted with the initial proving test plan (Table 4.17.7.1, Flight Hour Reduction Guide) and the cumulative effects of those reductions.

2) The team must document the decision to terminate the en route segment earlier than planned with an appropriate GACA Activity Report (GAR) comment (see Section 6,

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Reporting Procedures).

**C. Extension.** The tests may be extended beyond the point of scheduled termination. This action is taken when the applicant has not completely demonstrated the ability to conduct operations in compliance with regulations and safe operating practices, but shows the potential to do so in a reasonable number of hours. Applicants may not count proving test segments which are not completed successfully toward the required total proving test hours.

**D. Unacceptable Performance.** The team may terminate testing when it is apparent that the applicant is not capable of correcting deficiencies. When a decision is made to terminate proving tests due to extensive deficiencies, the following must be accomplished:

- 1) The CPM immediately informs the Director, Flight Operations Division of the reasons for the decision and receives the Director's concurrence before concluding testing.
- 2) The CPM then notifies the applicant of the decision. A letter confirming the reasons for this decision is forwarded to the applicant. This letter lists deficient areas and specifies corrective actions that must be taken before further en route testing may continue. This letter also specifies that a new proving test plan will have to be developed by the applicant and submitted to the GACA before further en route testing may resume. See Figure 4.17.5.2, Example of Letter to Applicant Terminating Proving Test, for an example letter. If the GACA discontinues the proving tests, rescind the applicant's LOA(s).

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**Figure 4.17.5.1. Tabletop Scenario Worksheet**

<b>Tabletop Scenario Worksheet</b>			
<b>Applicant:</b>	<b>Element:</b>	<b>Scenario Number:</b>	
<b>Scenario:</b> ..... ..... ..... ..... ..... ..... ..... .....			
<b>Expected Outcome:</b> ..... ..... ..... ..... ..... ..... ..... .....			
<b>Actual Outcome:</b> ..... ..... ..... ..... ..... ..... ..... .....			
<b>SAT</b> <input type="checkbox"/>	<b>UNSAT</b> <input type="checkbox"/>	<b>Date:</b>	<b>Test Team Member Name:</b>
<b>Separate here to provide question to the appropriate individual.</b> .....			
<b>Scenario:</b> ..... ..... ..... ..... ..... ..... ..... .....			

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### Figure 4.17.5.2. Example of Letter to Applicant Terminating Proving Test

GACA Letterhead

[Date]

[Name]

[Title]

[Address]

Dear Sir:

This letter is to inform you that effective March 12, 2012, First Jet Airlines' proving test demonstration flights with the B737 aircraft are hereby terminated by the General Authority of Civil Aviation (GACA) due to deficiencies that prevent First Jet Airlines from achieving the standards as specified in General Authority of Civil Aviation Regulations (GACAR) § 121.221(a).

Specifically, First Jet failed to demonstrate compliance in the following three areas:

1. *Dispatch*: During two flights conducted on March 10, 2008, First Jet dispatchers were unable to obtain required weather information for destination and alternate aerodromes (GACAR § 121.1349).
2. *Required Crew members*: On March 11, 2012, First Jet attempted to operate flight number 216 without the required complement of cabin crew members (GACAR § 121.753).
3. *Maintenance*: On March 12, 2012, First Jet was unable to perform basic required maintenance and servicing of flight number 217 due to difficulties with its contracted maintenance agency. This resulted in the cancellation of three other flights scheduled for March 12 and all flights scheduled for March 13 (GACAR § 121.659).

The GACA has determined that, in view of the above discrepancies, the continuation of proving tests is unwarranted and would serve no useful purpose. Before First Jet may commence any additional proving tests for GACA consideration and evaluation, First Jet must show that it has corrected the above deficiencies to the satisfaction of the GACA and submit another proving test plan and proposed schedule.

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Sincerely,

[CPM signature]

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#### CHAPTER 17. PROVING AND VALIDATION TESTS FOR PARTS 121 AND 135

##### Section 6. Reporting Procedures

**4.17.6.1. REPORT CONSTRUCTION.** The test team creates a report of proving or validation tests by means of the GACA Activity Report (GAR).

**A. Opening a Master GAR Record.** When a test team is formed, the CPM ensures that a master GAR record is opened. This GAR entry remains open until the team completes its assignment. The CPM enters his assigned aviation safety inspector (Inspector) identifier in the “Inspector Name Code” field so that he can be identified on the master record. The CPM also enters an “O” in the “Status: (COP)” field and enters the appropriate GAR codes in the “Activity Number” field, as follows:

1) *Proving Test GAR Codes.*

a) Operations:

- Initial certification (Part 121): 1202
- Initial certification (Part 135): 1212
- Proving flights: 1313

b) Airworthiness:

- Initial certification (Part 121): 3202
- Initial certification (Part 135): 3204
- Addition of an aircraft type or new kind of operation: 3337
- Proving flights and validation flights: 3318

2) *Validation Test GAR Codes.*

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### a) Operations:

- Approval of a geographic area requiring Performance-Based Navigation (PBN): 1402
- Approval of special navigation procedures (i.e., pilotage, special navigation procedures, celestial): 1410
- Special performance authorizations (i.e., Extended Operations (ETOPS)): 1441
- Special operational authorizations (i.e., CAT II, CAT III, EVS): 1442

### b) Maintenance:

- Approval of a geographic area requiring Performance-based Navigation (PBN): 3431
- Approval of special navigation procedures (i.e., pilotage, special navigation procedures, celestial): 3434
- Special operational authorizations (i.e., CAT II, CAT III, EVS): 3399

**NOTE:** The above GAR list is not all-inclusive.

**B. Progressive Comments on the Master Record.** As each of the five phases of the test process is completed, the CPM places a comment showing the date the phase was completed on the master record

**4.17.6.3. CLOSING THE MASTER RECORD.** After the team has completed the project, the CPM places a closing summary in the “COMMENT” section of the master GAR record. This summary is written as an executive overview and should avoid lengthy discussions or repetition of explanations contained in individual GAR entries. Once the summary has been completed, close the master record. The following are suggested items for the summary:

- Total test hours planned and actually flown
- Major deficiencies that required significant corrective action and the nature of those corrections

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- Major delays encountered in completing the project and reasons for those delays

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#### **CHAPTER 17. PROVING AND VALIDATION TESTS FOR PARTS 121 AND 135**

##### **Section 7. Request for Reduction of Proving Test Hours**

4.17.7.1. GENERAL. General Authority of Civil Aviation Regulations (GACAR) § 121.221 contains authority for the General Authority of Civil Aviation (GACA) to reduce the proving flight hours specified in the basic regulation. Improvements in technology, training methods, communications, and established safe operating practices can enable an applicant to demonstrate compliance with applicable regulatory requirements in less time than the hours specified. Advanced simulation, Line-Oriented Flight Training (LOFT) scenarios, loading and maintenance exercises, and operational research and statistical analysis are some of the means applicants may use to demonstrate competence. As part of the plan, the applicant may request a reduction from the applicable regulatory requirements. The request must explain how the applicant intends to demonstrate regulatory compliance with a reduced hour program. If the applicant's plan contains a request for reduction, it must include at least the following additional information:

**A. Total Hours of Operation.** The plan must include the total number of hours that the applicant proposes to fly in the reduced program.

**B. Flight Experience Resume.** The plan must include a flight experience resume for each flight crew member that the applicant intends to use during the proving flight. This resume must include:

- Certificates
- Total flight time
- Any previous experience in the aircraft being tested
- Years of experience with the applicant
- Any other experience in GACAR Parts 121, and/or 135 operations (as applicable)
- Other transport experience, such as military

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**C. Justification Statement.** The statement must contain, but is not limited to:

- Applicant experience with GACAR Part 121, or Part 135 operations
- Applicant experience with aircraft of the same class (GACAR Part 121) or type (GACAR Part 135)
- Applicant experience with the aerodromes and areas of en-route operation into which the aircraft will operate

**D. Other information.** The plan must include any other information requested by the certification project manager (CPM), if applicable, or any information that the applicant believes will be useful in justifying the reduction. Other information could include nighttime routes to be flown or special aerodromes to be observed.

**NOTE:** GACAR §§ 121.225 and 135.113 do not grant a specific reduction of proving test hours, but have a broader statement of relief from the entire regulation "...The President may provide relief from this section if he finds that special circumstances make full compliance with this section unnecessary".

### 4.17.7.3. EVALUATING THE APPLICANT'S REQUEST .

**A. Evaluation Considerations.** The following are topics that the test team should consider when evaluating the request:

- If the aircraft has not been used previously by a Saudi Arabian operator, to what extent has the aircraft been operated by foreign operators?
- For newly certificated aircraft, how familiar is the test team with the aircraft?
- For aircraft that are new to the applicant but that have been proven previously in GACAR Part 121 or 135 operations, to what extent is the overall operation affected by the new aircraft (changing from GACAR Part 135 to Part 121, unscheduled to scheduled)?
- To what extent is the new aircraft substantially different from aircraft previously flown by the applicant (such as changing from turboprop to turbojet, unpressurized to pressurized, narrow body to wide body)?

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- To what extent is the applicant's route structure affected by the request (for example, inauguration of international routes and use of special areas of operation)?
- What is the experience level of personnel involved in the operation (for example, flight and cabin crew members' previous experience in the operation of this type of aircraft)?
- How does the applicant propose to conduct the proving flights (for example, a few long-range versus several short-range flights)?
- What level of management experience exists in the company with this type or similar type or make of aircraft?

**B. Flight Hour Reduction Guide.** The applicant may make a request for reduction in proving flight hours when the proving test plan is submitted. The GACA proving test team may approve these reductions at the field level. Test teams should use Table 4.17.7.1 as a guide to determine whether a reduced flight hour program is suitable.

**C. Approval or Denial of Reduction.** If the GACA approves a request for a reduction to the required number of proving flight hours, inform the applicant by letter that the reduction is approved. The letter approving the reduction must also indicate acceptance of the applicant's proving flight plan. If the GACA denies the request, inform the applicant of the decision by a letter that explains the reasons for denial.

**D. Conditions of Approval.** When the GACA approves a reduction, the test team must ensure that the applicant understands that the reduction specifies the minimum number of proving flight hours that must be planned, and that additional proving flights may be required if the applicant fails to demonstrate the ability to comply with all applicable regulations. The applicant should also be advised that potential delays due to problems such as maintenance, additional crew member training requirements, and weather may extend the proving flight schedule, which could affect the date the applicant intends to start revenue operations.

**Table 4.17.7.1. Flight Hour Reduction Guide**

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SITUATION	PERCENT REDUCTION
New aircraft not previously proven by another GACAR Part 121 or Part 135	0%
New operator having no management experience with aircraft category and class	10%
Existing GACAR Part 135 operator having no management experience in GACAR Part 121 operations and vice versa	15%
Existing operator having no management experience with aircraft category and class	20%
New operator having management experience with aircraft category and class	20%
Existing operator having management experience with same category and class	25%

**NOTE:** For reduction requests in excess of 25 percent, it is necessary to seek the approval of the President

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### VOLUME 4. OPERATOR & AIR AGENCY - ADMINISTRATION

#### CHAPTER 17. PROVING AND VALIDATION TESTS FOR PARTS 121 AND 135

##### Section 8. Validation Test Requirements

**4.17.8.1. GENERAL.** This section contains guidance for aviation safety inspectors (Inspectors) to use when conducting validation tests. This guidance supplements the general guidance found in Sections 1 through 7, of this Chapter.

**A. Regulatory Background.** Various regulations, such as General Authority of Civil Aviation Regulation (GACAR) §§ 121.73 and 135.113, require applicants to show the capability to conduct specific operations safely and in compliance with regulatory requirements. Validation testing is one process by which an applicant demonstrates this capability to the General Authority of Civil Aviation (GACA).

1) *Validation Flights.* The most common method the GACA uses to validate an applicant's capability is to observe the applicant conduct flight operations. For example, the GACA requires validation flights before initially issuing operations specification (OpSpec) B34, which authorizes operations utilizing performance-based navigation (PBN).

2) *Validation Testing Without a Validation Flight.* A validation flight may be required when adding a new aircraft/navigation system combination to OpSpec B34 of an applicant's authorizations. Tables 4.17.8.1 through 4.17.8.5 provide guidance on when a flight is required during validation testing.

3) *Areas of Emphasis.* When the GACA conducts validation testing, with or without an actual flight, the test team must still conduct an in-depth review of the applicable portions of the applicant's proposed procedures. Examples include:

- Operational control
- Flight planning
- Safe operating practices
- Aircraft equipment requirements

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- Abnormal procedures
- Critical performance requirements
- Training programs
- Manuals
- Facilities
- Maintenance programs

**B. Combined Proving and Validation Flights.** An applicant conducts proving flights to demonstrate its capability to operate a specific type of aircraft. An applicant conducts validation tests to demonstrate its capability to operate over specific routes while using applicable navigational equipment, or to operate within the specified limitations in critical areas. Though proving and validation tests satisfy different regulatory requirements, it is acceptable for applicants to conduct both tests simultaneously.

**4.17.8.3. SITUATIONS REQUIRING VALIDATION TESTS OR FLIGHTS.** This paragraph contains guidance for aviation safety inspectors (Inspectors) and certification project managers (CPM) concerning those situations where validation flights or tests are required for compliance with GACAR §§ 119.107, 121.73 and 135.113.

**A. Operations Outside Kingdom of Saudi Arabia (KSA) Airspace.** When an applicant plans to operate to a destination outside of KSA airspace, the test team must verify that the applicant has the required economic authority, knowledge of applicable national operating rules, and has completed adequate planning for the proposed operation. Normally, validation for this purpose alone does not require a flight.

**B. Special Performance Authorizations.** The GACA requires validation tests when an applicant proposes to conduct operations that require confirmation of the applicant's ability to operate an aircraft type within specified performance limitations. The GACA bases these limitations on the following situations (see paragraph 4.17.8.5, below):

- Character of the terrain (or extended overwater areas)

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- Type of operation
- Performance of the aircraft (normal and abnormal)

**C. Special Operational Authorizations.** The GACA requires validation tests when an applicant proposes to conduct in-flight or ground maneuvers that require special operational authorizations (see paragraph 4.17.8.7, below).

- 1) A satisfactory validation flight by the applicant allows for the addition of a new aircraft/navigation system combination (e.g. for OpSpec B34). However, test teams may validate the new combination using testing alone, provided the applicant can demonstrate that the new combination of an aircraft/navigation system and its operation require no significantly different procedures from those for which the applicant is currently authorized, or where the applicant can show satisfactory current experience.
- 2) If a validation does not include a flight, the applicant must still show that the procedures, training, and qualification of flight crews are in accordance with the GACAR and acceptable equipment operation (see paragraph 4.17.8.11, below). Test teams can determine the current level of flight crew training and qualification by conducting oral tests of knowledge and procedures, and by evaluating flight records.

**D. Additional Geographic Areas.** The GACA will normally authorize operation in additional geographic areas (other than special areas of operation) to an applicant who requests such authorization without a validation flight. As a minimum for this situation, the test team must verify that the applicant has the required economic authority, knowledge of applicable national operating rules, and has completed adequate planning for the proposed operation. Test teams may determine, however, that specific circumstances require a flight.

**E. Special Areas of Operation.** For purposes of validation, the GACA designates certain areas as special operating airspace.

- 1) *Extensive Areas of Magnetic Unreliability (AMUs)* (OpSpec B40). Applicants must conduct validation flights through these areas due to the nature of the procedures involved as a condition of initial issuance of OpSpec B40. Test teams may approve validation by means of testing in lieu of flights when an applicant that already holds OpSpec B40 proposes to operate new combinations of aircraft and navigation systems in these areas.

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2) *Minimum Navigation Performance Specifications (MNPS) Airspace* (OpSpec B39).

Due to the navigational tolerances and the procedures required, applicants must conduct validation flights through these areas before receiving initial authorization to conduct revenue operations in these areas.

3) *Operations in the Pacific Track Systems* (OpSpec B37). During validation for approval of CEPAC and NOPAC areas, test teams should focus on flight planning, especially for engine-out and loss of pressurization contingencies. No requirement exists for an applicant already holding OpSpec B37 who has a demonstrated satisfactory operating history in NAT/MNPS airspace to conduct a validation flight as a condition for the issuance of a CEP or NOPAC operating authorization. A requirement may exist for a validation flight of an applicant requesting an authorization to operate a new combination of aircraft and navigation systems before adding this new combination authorization to that applicant's OpSpec B37. Normally, no requirement exists to conduct this flight through CEP or NOPAC airspace if the NAT/MNSPA and/or AMU has been previously demonstrated and authorized.

4) *Polar Operations* (OpSpec B55). Applicants proposing to conduct terminal area operations within these areas must conduct validation flights. No requirement exists for validation flights for those applicants conducting overflights if authorized in OpSpec B34 and B40. During validation for approval of overflights of these areas, test teams should focus on flight planning, especially for engine-out, loss of pressurization contingencies, and emergency airfield procedures and communications.

**F. Special or Unique Navigation Procedures.** The GACA normally requires validation flights when an applicant proposes to use navigation procedures that it did not previously demonstrate. These procedures include:

- Pilotage
- Free gyro or grid procedures (by qualified individuals)
- Any combination of the preceding procedures (by qualified individuals)

**4.17.8.5. SPECIAL PERFORMANCE AUTHORIZATIONS.** The following are examples of operational situations that normally require validation tests and special performance authorizations for each type of aircraft the applicant intends to use:

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- Terminal area and en-route operations in areas of mountainous terrain requiring high elevation aerodrome operations, driftdown, or other specialized contingency procedures
- Part 121 Extended Operations (ETOPS) (2 Engine) over routes containing a point farther than 60 minutes' flying time from an adequate aerodrome (OpSpec B42)
- Powerback operations (reverse thrust taxi) (OpSpec C65)
- Rotorcraft or seaplane operations in highly congested urban areas (see OpSpec R114 for rotorcraft operations)

**4.17.8.7. SPECIAL OPERATIONAL AUTHORIZATIONS.** The GACA normally requires validation tests when proposed operational situations require special equipment and a special operational authorization for each type of aircraft used. Some examples are:

- Category II instrument approach and landing systems (OpSpec C59)
- Category III instrument approach and landing systems (OpSpec C60)
- Use of automatic landing systems for landing operations (OpSpec C61)
- Use of manually flown flight control guidance systems approved for landing operations (heads-up or heads-down flight control systems) (OpSpec C62)
- RNP AR APCH approach and landing operations (OpSpec C84)

**4.17.8.9. PLANNING THE VALIDATION TESTS.** An applicant that must conduct a validation test must develop and submit a test plan. The applicant must tailor the plan and test objectives to the situation. The GACA team and the applicant should use the following guidelines in planning validation tests.

**A. Form and Content of the Test Plan.** The variety of operational situations and requirements that determine the makeup of validation tests makes it impossible to specify the form and content for each validation test plan. It is the Inspectors responsibility to brief the operator regarding the GACA requirements that need to be included in the test plan.

**B. GACA Test Team and Applicant Coordination.** The applicant and test team must agree on

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the form and content of the test plan and they must establish mutual understandings of test objectives, the degree of demonstration required, and the evaluation criteria.

**C. Operational Demonstrations.** Most validation tests will require some form of operational demonstration. When operational demonstrations are required, the validation test plan must include a schedule for those demonstrations.

**D. Determining Number of Flight Hours.** Regulations do not specify a required number of hours for a validation flight. On a case-by-case basis, the GACA determines the number of flight hours for a validation flight.

**E. Revisions to Applicant Documents and Training Program.** Most special authorizations require revisions to the applicant's checklists; minimum equipment lists (MEL), applicable operations manuals (OM), Maintenance Manual (MM), and training programs. The applicant should submit these revisions with the validation test plan for GACA review and approval or acceptance, as appropriate.

**F. Amendment to OpSpecs.** All special authorizations require an amendment to the OpSpecs. The applicant should apply for the amendment when it submits the validation plan. The revisions/amendments to the OpSpecs that require identifying the navigation and/or communications systems installed in each aircraft type shall specifically identify the number of independent systems installed, the type of system, and critical components of that system, so as to comply with air traffic service (ATS) airspace requirements (both GACA and foreign air traffic management (ATM)) of that specifically authorized area, nation, or Special Area of Operation (SAO). The specific communications and navigation sensors must also be identified to ensure compliance with the area or SAO airspace requirements, which are authorized.

**4.17.8.11. AREAS EVALUATED ON VALIDATION TESTS OR FLIGHTS.** The types of activities and items the GACA must inspect and evaluate on validation tests or flights vary with the type of authorization the applicant requests. Examples of activities and items requiring inspection and evaluation include:

- Crew training (cabin crew member (CCM) training, if applicable)
  - Dispatcher and flight locator training and responsibilities
  - Operations manual information and crew procedures
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- Checklists and MEL/Configuration Deviation List (CDL)
- Maintenance manual information and maintenance program
- Equipment certifications and installation approvals
- Reliability and accuracy of applicable operational and maintenance records
- Operational flight control and company communication capabilities
- Flight crew competency in use of equipment, procedures, and techniques
- Coordination procedures between the flight crew, maintenance personnel, and other ground personnel

**4.17.8.13. CARRIAGE OF REVENUE PASSENGERS ON VALIDATION FLIGHTS.** The GACARs *do not* forbid the carriage of revenue passengers on validation flights. With the concurrence of the Director, Flight Operations Division, the test team *may* authorize the applicant to carry revenue passengers aboard the validation flight when the proposed operation is similar to those in the applicant's previous experience. Generally, the carrying of passengers is prohibited when the applicant has not previously operated a specific aircraft type in operations that require a special performance authorization.

A. Test teams *may* consider permitting the carriage of revenue passengers if the applicant meets the following conditions:

- 1) *Use of a Previously Authorized System.* For those applicants seeking approval to conduct navigation by means of a new system or by means of a new procedure, the applicant may use a previously authorized navigation system as an independent means of verifying position.
- 2) *Previous Demonstration of Competence.* For operations that require a special performance authorization, the applicant must have already successfully demonstrated competence by safely conducting those operations using the necessary special performance in the specific aircraft. The applicant can demonstrate competence through an approved flight simulation test program, or in an actual aircraft flight test program (nonrevenue) in the specific aircraft.

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**B. Special Operational Authorization.** For operations requiring a special operational authorization for approach and landing operations (see paragraph 4.17.8.7, above), the GACA normally permits the carriage of revenue passengers, provided higher minimums or visual flight rules (VFR) operations are specified during the validation tests.

**C. Additional Considerations.** Consider the following factors in all cases:

- The applicant's previous experience with the proposed kind of operation, specific aircraft, and equipment combinations
- The GACA test team's previous experience with the proposed kind of operation, specific aircraft, and equipment combinations
- The in-service history and performance considerations of any new airplane, component, or other critical equipment combinations
- The degree of backup system redundancy and sole dependency of any particular system or component

**4.17.8.15. VALIDATION TABLETOP EXERCISES.** Validation testing should include validation flights and ground exercises, such as simulators and tabletop simulations. The validation test team may be able to determine some of the applicant's capabilities with well-structured tabletop simulations in place of a flight. If the applicant intends to use tabletop simulations, it should include their use in the validation test plan (see Section 5 of this Chapter for further guidance).

**4.17.8.17. SPECIAL AUTHORIZATION INFORMATION TABLES.** Tables 4.17.8.1 through 4.17.8.5 are general information references for proving and/or validation tests. Do not consider or use the tables as all-inclusive sources of information.

**NOTE:** The OpSpec authorizations cited in these tables are not applicable to every type of operation (e.g., Part 135, and Part 121). Use the guidance found in Volume 15, Operations Specifications (OpSpecs).

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**Table 4.17.8.1. Special Authorization Information Table—Special Areas of Operation**

<b>Special Areas of Operation: (Tables are not all inclusive)</b>	<b>Validation Test (Table Top Demo)</b>	<b>Validation Flights Required</b>	<b>Pax/Cargo Authorized Onboard</b>	<b>OpSpec Authorizations</b>
1. Areas of Magnetic Unreliability (AMU)	Yes	Yes	Cargo Only	B40
2. Minimum Navigation Performance Specifications (MNPS) Airspace	Yes	Yes	Cargo Only	B39
3. Operations in the Pacific Track Systems	Yes	Yes	Cargo Only	B37
4. Polar Operations (Excluding AMU)	Yes	Yes, if no AMU authorization	Cargo Only	B55

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Table 4.17.8.2. Special Authorization Information Table—Special Performance Authorizations

Special Performance Authorizations:  (Tables are not all inclusive)	Validation Test (Table Top Demo)	Simulator (Option)	Validation Flights Required	Pax/Cargo Authorized Onboard	OpSpec Authorizations
1. Extended Operations (ETOPS)	Yes	Partial	Yes	Cargo Only	B42
2. Special Aerodrome Operations Examples include: <ul style="list-style-type: none"> <li>• High Elevation Aerodromes</li> <li>• Terrain considerations</li> <li>• Limited NAVAIDs</li> </ul>	Partial	Yes	No	Cargo Only	C50
3. Power Back Operations	Partial	No	Yes	Pax or Cargo	C65
4. RVSM	Yes	Yes	No	Pax or Cargo	B46

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**Table 4.17.8.3. Special Authorization Information Table—Special Operational Authorizations**

<b>Special Operational Authorizations: (Tables are not all inclusive)</b>	<b>Validation Test (Table Top Demo)</b>	<b>Simulator (Option)</b>	<b>Validation Flights Required</b>	<b>Pax/Cargo Authorized Onboard</b>	<b>OpSpec Authorizations</b>
1. Category I, II, or III Approach and Landing Operations	No	Partial	No—I Yes—II & III	Cargo Only	C52, C59, C60,
2. Use of Automatic Landing Systems for Landing Operations	No	Yes	No	N/A	C61
3. Use of Manually Flown Flight Control Guidance System for Approach and Landing Operations	No	Yes	No	N/A	C62
4. Performance-based navigation (PBN)	No	Yes	No, unless initial PBN	N/A, unless initial PBN	B34
5. RNP AR APCH	No	Yes	Yes	N/A	C84
6. EVS	No	No	Yes	(TBD)	C48
7. Night Vision	No	No	Yes	N/A	R123
8. REMS	No	No	Yes	(TBD)	R125
9. Air Ambulance	(TBD)	(TBD)	(TBD)	(TBD)	A24, R124
10. Transportation of Dangerous Goods (TDG)	No	No	No	N/A	A55

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**Table 4.17.8.4. Special Authorization Information Table—Unique Authorizations for Part 121/135 Operations**

<b>Unique Authorizations For Part 121/135 Operations: (Tables are not all inclusive)</b>	<b>Validation Test (Table Top Demo)</b>	<b>Simulator (Option)</b>	<b>Validation Flights Required</b>	<b>Pax/Cargo Authorized Onboard</b>	<b>OpSpec Authorizations</b>
1. Any change or addition in operating authority, such as: <ul style="list-style-type: none"> <li>• VFR to IFR</li> <li>• To/from Cargo, passenger, Combi Operations</li> <li>• Domestic to International or vice versa</li> </ul>	Partial	No	Yes	Cargo Only	As Applicable
2. Any change or addition in operating authority: <ul style="list-style-type: none"> <li>• Domestic to International or vice versa</li> </ul>	Partial	No	No, unless flown to/from a location where special means of navigation or special circumstances exist	Cargo Only	As Applicable
3. Addition of a rotorcraft to an all airplane certificate or vice versa	Partial	No	Yes	Cargo Only	As Applicable
4. Any new technologies or systems presented to GACA that would require validation/proving testing	TBD	TBD	TBD	TBD	TBD

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### **VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 18. AIRWORTHINESS PROGRAMS FOR PART 125**

##### **Section 1. Evaluate Maintenance Manuals for Part 125**

###### **4.18.1.1. GACA ACTIVITY REPORT (GAR).**

A. 3302 (AW) (Initial-Evaluate Manual)

B. 3303 (AW) (Revision-Evaluate Manual)

**4.18.1.3. OBJECTIVE.** This section provides guidance for evaluating a Part 125 operator's Maintenance Manual (MM) and the revisions to that manual.

**NOTE:** The term "operator" will be used for both an existing General Authority of Civil Aviation Regulations (GACAR) Part 125 operator and an applicant.

###### **4.18.1.5. GENERAL.**

**A. Manual Purpose.** The MM must provide policies, procedures, and technical criteria in sufficient detail to ensure that regulatory requirements are fully met.

**NOTE:** Additional guidance regarding manuals can be found in Volume 4, Chapter 12, Section 2, Approval and Acceptance of Manuals and Checklists.

1) The manual must be written so as to be readily understood. GACAR § 125.77 requires each operator to prepare and keep current a maintenance manual for the use and guidance of flight operations, ground operations, and management personnel as appropriate in conducting its operations. The original manual must be reviewed and accepted by the General Authority of Civil Aviation (GACA) before it is implemented by the operator. A manual revision may be issued by the operator prior to being reviewed and accepted by the aviation safety inspector (Inspector).

2) The manual should define all aspects of the operator's organization.

a) The maintenance section must address policies, procedures, and standards for

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administering the aircraft inspection program and any other subject appropriate for the particular operator.

b) The operator is responsible for ensuring that the manual provides sufficient guidance for maintaining a high level of safety and is responsible for ensuring that the material complies with the regulations.

**B. References for Manual Development.** Other guidance material may be used to assist the operator in developing the manual. The operator should use caution when incorporating the text of these documents into the manual since they are advisory and may not meet the exact needs of the operator. Under no circumstances may the manual simply reference an advisory document. It may, however, reference technical documents, such as equipment manufacturer's manuals or service bulletins.

**4.18.1.7. MANUAL CONTENT.** There are certain items that the manual must cover in accordance with GACAR Part 125, Appendix A. Additional items may be incorporated at the discretion of the operator, provided they are not contrary to the regulations and the operator's operations specifications (OpSpecs).

**A. Definitions and Acronyms.** Each significant term used in the manual should be well explained if it is not defined in GACAR Part 1. The definitions must reflect their intended use and include acronyms and/or abbreviations unique to the manual.

**B. Content.** The maintenance manual must contain at the least the following:

- 1) A description of the operator's maintenance organization.
- 2) A list of those persons with whom the operator has arranged for performance of inspections, which must include the persons' names and addresses.
- 3) The aircraft inspection programs required by GACAR § 125.309 to be followed in the performance of inspections.
- 4) A description of the maintenance procedures and the procedures for completing and signing an airworthiness release prepared in accordance with GACAR § 125.541.
- 5) A description of the methods used for the completion and retention of the operator's

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maintenance records required by GACAR § 91.457.

- 6) A description of the procedures for service difficulty reporting required by GACAR § 125.539.
- 7) A description of the procedures for implementing action resulting from mandatory continuing airworthiness information.
- 8) A description of the system of analysis and continued monitoring of the performance and efficiency of the inspection program, in order to correct any deficiency in that program.
- 9) A suitable system, which may include a coded system, that provides for the retention of the following:
  - Procedures and policy instructions regarding the operator's operations
  - Procedures for ensuring that the PIC knows that required airworthiness inspections have been made and that the aircraft has been approved for return to service in compliance with applicable maintenance requirements
  - Procedures for reporting and recording mechanical irregularities that comes to the attention of the PIC before, during, and after completion of a flight
  - Procedures to be followed by the PIC for determining that mechanical irregularities or defects reported for previous flights have been corrected or that correction has been deferred
  - References to the approved aircraft inspection program

**C. Additional Manual Contents.** The above listing is only a portion of the required contents for an operators maintenance and operations manuals. Inspectors should refer directly to GACAR § 125, Appendix A for a complete listing before accepting any manuals presented for review and acceptance.

**D. Revision System.** Manuals must be easy to revise. Each revised page must show the revision number and date. The manual should have a page control system which shows the number of pages and ensures the latest revision is included. Page control usually is identified as a list of

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effective pages.

**4.18.1.9. FUELING PROCEDURES.** The manual must specify procedures for servicing of the aircraft.

**A. No Servicing Arrangements.** The manual must contain procedures for the pilot to use at a place where previous arrangements have not been made by the operator, when the pilot is authorized to so act for the operator.

**B. Fuel Contamination and Fire Protection.** The manual must contain procedures for refueling aircraft, eliminating fuel contamination, protecting from fire (including electrostatic protection), and supervising and protecting passengers during refueling. Inspectors should consider the following items when reviewing the manual in regard this item:

- Proper grounding of the aircraft
- Use of any required electrical equipment
- Availability of proper fire-fighting equipment
- Minimum distance from other equipment, such as the Auxiliary Power Unit, other vehicles, etc.
- Smoking and fire restrictions
- Prohibiting fueling in hangars or in proximity to electrical storms
- Any other procedures determined necessary by the Inspector or operator

**C. Passenger Protection.** The manual must have procedures to ensure the safety, supervision, and welfare of all persons on board the aircraft, including any person who may be incapacitated. The effects of fuel fumes, accidental spills, fire, weather, and other factors should be considered.

**4.18.1.11. INITIAL CERTIFICATION.** During initial certification, applicants are encouraged to submit drafts of the manual before submitting a formal application. This enables Inspectors to determine if the applicant is proceeding in an appropriate manner. Inspectors should retain copies of the draft after review to ensure that recommended changes are incorporated and no other changes have been made.

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**4.18.1.13. COMPLIANCE STATEMENT.** During an initial certification the compliance statement often references the operations manual (OM) and MM. Therefore, Inspectors must ensure these documents do not conflict and that references to the manual are accurate.

**4.18.1.15. ACCEPTING A MANUAL.** The original manual is accepted rather than approved. An acceptance letter is sent to the operator indicating that the policies and procedures are not contrary to the requirements of the GACAR. It is important that the manual be reviewed and accepted by all specialties.

**NOTE:** While the MM itself does not have to be approved, there may be areas/sections within the manual that do require approval e.g. approved aircraft inspection program, and approved minimum equipment list (MEL).

**NOTE:** There is no requirement to sign and date the complete manual. Each page should not be initialed and dated by the Inspector.

**4.18.1.17. MANUAL REVISIONS.** Inspectors should encourage operators to discuss manual revisions prior to printing and distributing them. Review for conformity with regulatory requirements and the operator's operations specifications and operating certificate can preclude the operator's having to make costly changes after a revision has been printed and distributed. When a manual revision which does not conform to the appropriate regulations or the operator's operations specifications or operating certificate is printed and distributed, the Inspector should immediately notify the operator in writing. The Inspector should request appropriate action to resolve the discrepancy to the satisfaction of the Director, Airworthiness Division.

**4.18.1.19. COORDINATION REQUIREMENTS.** This task may require coordination between Airworthiness and Operations Inspectors.

### 4.18.1.21. REFERENCES, FORMS, AND JOB AIDS.

#### A. References.

- GACAR Parts 43, 91 and 125
  - Volume 4, Chapter 19, Section 4, Evaluate Refueling Procedures and Facilities for Parts 121, 125 and 135
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**B. Forms.** GACA Activity Report (GAR).

**C. Job Aids.** None.

### 4.18.1.23. PROCEDURES.

**A. Receive Manual, Revision, or Draft for Review.**

- 1) *Time Frame.* If this task is performed as part of an original certification, review the Schedule of Events to determine the time frame for completing the manual review.
- 2) *Assess the extent of the revision.* If the revision affects only one area, it may not be necessary to review the entire manual. However, if a revision has a significant effect on several areas, or is, in effect, a new manual, review the entire manual. Ensure that each page shows the proper revision number and date.
- 3) *Review the operator file.* Determine the reason for the revision (i.e., an Inspector action, change in operations specifications, change of equipment, environment).
- 4) *Review the Compliance Statement.* For original certification, ensure that the manual is not contrary to the operator's compliance statement.

**NOTE:** When reviewing the manual, ensure that each item listed in GACAR Part 125, Appendix A, II Maintenance Manual, is addressed. Items addressed must be complete, accurate, and ensure that the operator can maintain a high degree of safety and efficiency. Ensure that none of its provisions, procedures, instructions, etc., is contrary to other sections of GACAR Part 125 or other regulations.

**B. Review Management Personnel Authorizations.** The manual must contain the name of each management person authorized to act for the operator. The manual must describe the assigned area of responsibility, duties, responsibilities, and authority.

**C. Ensure Inclusion of Mass and Balance Procedures.** The manual must contain procedures to ensure that aircraft have been weighed within the preceding 36 calendar-months. The operator may use fleet averaging if authorized in their operations specifications.

**D. Inclusion of OpSpecs.** It is recommended that the manual contains a copy of the applicable

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operations specifications or appropriate extracted information.

**E. Review Procedures for Approving Aircraft for Return to Service.** The following must be addressed:

- Qualifications and authorizations of persons approving aircraft for return to service
- Procedures for determining when an airworthiness release or maintenance record is required
- The form and manner of documenting that an aircraft is approved for return to service (airworthiness release or aircraft maintenance record)
- A procedure to ensure the airworthiness release or aircraft maintenance record entry contains any required certifications.

**NOTE:** This requirement may be met by stating in the manual that the signature of a person authorized in GACAR § 43.5 constitutes approval for return to service after maintenance.

- A means of ensuring the pilot in command obtains a copy of the airworthiness release
- Procedures to ensure that each airworthiness release is retained for at least 60 days

**F. Review Procedures for Reporting Defects or Un-airworthy Conditions.** Ensure that procedures address the following:

- Items required to be reported
- Responsibilities of the pilot in command
- Persons responsible for preparing and submitting the report
- The form and manner of the report, such as existing GACA form, operator-developed form, or computer printout
- Submission of the report as per GACAR § 125.539 requirements
- Updating of the report on a periodic basis, until all information is finally submitted

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**G. Evaluate Procedures for Obtaining Maintenance When Previous Arrangements Have Not Been Made.** The manual must outline appropriate procedures for obtaining maintenance, preventive maintenance, or servicing that has not been arranged previously.

1) Ensure that the manual accomplishes the following:

- Indicates persons authorized to arrange for the maintenance, preventive maintenance, or servicing
- Describes procedures for the pilot in command to obtain maintenance, preventive maintenance, or servicing at a location where previous arrangements have not been made

2) If the pilot in command is authorized to obtain the maintenance on behalf of the operator, the manual must contain procedures for the pilot to determine if the maintenance facility is capable of performing the necessary work. The following factors should be considered:

- Type of aircraft
- Type of maintenance or service required
- Certificate and rating of an approved GACA facility
- If non-certificated facility, an appropriately rated, fully qualified, and current GACA-certificated mechanic is required
- Required Inspection Items (RII)
- Approval for return to service requirements
- Additional factors identified by the operator or Inspector

**H. Review Procedures Regarding Inoperable Equipment.** The manual must describe procedures for operating when equipment becomes inoperable en route. If this requirement is met using an approved Minimum Equipment List (MEL), the approved list must be a part of the manual.

**I. Review Aircraft Fueling Procedures.** Evaluate the following:

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- Elimination of fuel contamination
- Fire protection
- Passenger protection
- Procedures for supervising fueling activities
- Electrostatic protection

**J. Ensure Description of Operator's Maintenance Organization.** Ensure that the manual describes the operator's maintenance organization, if applicable.

**K. Review List of Inspectors.** Review list of those persons with whom the operator has arranged to perform inspections. Names and addresses must be included.

**L. Ensure Inclusion of Approved Airplane Inspection Program.** In addition to the approved program, the following must be addressed:

- Method of performing routine and non-routine inspections
- *Routine Inspection Items (RII).* These are items which, if improperly inspected, may result in a failure, malfunction, or defect that could adversely affect the safe operation of the airplane.
- Method of performing RII inspections
- Procedures for inspecting work performed under previously RII inspection findings (buy-back procedures)
- Procedures, standards, and limits for RII inspections and for accepting or rejecting items required to be inspected
- Instructions to prevent a person who performs any item of work from performing any RII inspection of that item
- Procedures to ensure that work interruptions do not adversely affect RII inspections

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- Procedures to ensure that RII inspections are properly completed before the airplane is released to service

### **M. Evaluate Recordkeeping System.**

1) Ensure that the manual contains a suitable system, which may include a coded system that provides for the retention of the following:

- A description of the work performed (or reference to data acceptable to the GACA)
- The date the work was performed
- The name of the person performing the work and the person's certificate type and number
- The name of the person approving the work and the person's certificate type and number

2) Ensure recordkeeping requirements of GACAR § 91.457 are met.

### **N. Evaluate Procedures for Performing Maintenance, Preventive Maintenance, and Alterations.**

**O. Review Procedures for Using the Maintenance Log.** The manual must contain policies and procedures for using the aircraft maintenance log. There must be provisions for keeping a copy of the aircraft maintenance log in the aircraft.

### **P. Review Manual Revision and Distribution Procedure.**

1) Ensure that the revision system addresses distribution.

- a) The manual must be retained at the main base of operation.
- b) A copy or appropriate portions of the manual must be provided to the operator's flight crew members and the GACA.
- c) The manual or appropriately extracted information must be provided to the operator's maintenance and ground crew.

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- d) Each aircraft must have on board at least the information regarding its particular needs and differences, unless the operator is operating into a facility where the information is kept.
- 2) Ensure that procedures for revising and distributing the manual provide all manual holders with current information.

**Q. Analyze Findings.** Evaluate all unclear areas, omissions, or apparent discrepancies to determine if changes are required.

**R. Conduct Debriefings.**

- 1) Discuss initial findings with appropriate Supervisors and assigned principal Inspectors.
- 2) Brief operator on results of evaluation and discuss any deficiencies.

### 4.18.1.25. TASK OUTCOMES.

**A. GAR.** Complete and file GACA Activity Report (GAR).

**B. Completion of Task.** Completion of this task will result in the following:

- 1) *Acceptance of the Manual/Revision.* If it is determined that the manual or revision meets all regulatory requirements, ensure the manual or revision has been fully coordinated with each specialty.
  - a) The Inspector should send the operator a letter accepting the manual. The office file should be updated with copies of the acceptance letter.
  - b) Revisions may be accepted by either of the following actions:
    - The Principal Maintenance Inspector (PMI) will receipt and return the revision transmittal to the operator
    - The PMI will send a letter accepting the revision

**NOTE:** At no time will the manual pages be signed, initialed, and dated as accepted in any

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part of the manual.

2) *Rejection of manual.* If the manual is not acceptable, accomplish the following:

- a) Advise the operator by letter that the manual is rejected and return it to the operator along with the reasons for the rejection.
- b) When this review is performed as a part of a certification, inform the applicant in the letter that issuance of the certificate will be withheld until deficiencies are corrected.
- c) When this review is for a manual revision, request in writing, to take appropriate action to resolve the discrepancies. The operator must make the corrections in the subsequent revision.

### **4.18.1.27. FUTURE ACTIVITIES.**

**A. Schedule of Events.** In the case of original certification, review the Schedule of Events to determine if a revised Schedule of Events is necessary.

**B. Surveillance.** Within 30 days, determine whether the operator is operating in accordance with the accepted manual procedures.

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### **VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 18. AIRWORTHINESS PROGRAMS FOR PART 125**

##### **Section 2. Evaluate Aircraft Inspection Program and Engine Maintenance for Part 125**

###### **4.18.2.1. GACA ACTIVITY REPORT (GAR).**

- A. 3341 (AW) (Initial-Evaluate Inspection Program)
- B. 3342 (AW) (Revision-Evaluate Inspection Program)

**4.18.2.3. OBJECTIVE.** This section provides guidance on how to evaluate and approve a General Authority of Civil Aviation Regulations (GACAR) Part 125 operator's submitted Aircraft Inspection Program (AIP) including the engine maintenance program or revision.

**4.18.2.5. GENERAL.** This job task provides for interaction between the applicant and the Principal Maintenance Inspector (PMI) from initial inquiry to approving the program/revision. It ensures that programs, systems, and intended methods of compliance are thoroughly reviewed, evaluated, and tested.

**A. GACA Approval.** The General Authority of Civil Aviation (GACA) must approve an aircraft inspection program selected by an operator under GACAR Part 125. The PMI reviews the program to ensure that it meets regulatory requirements, is complete, and is appropriate for the intended operation.

**B. PMIs.** PMIs should have as much knowledge of the operator's operation as possible. This includes areas of operation, type of equipment, operating history, and maintenance/inspection organization(s).

NOTE: An AIP is authorized for use in operations specifications (OpSpecs) and cannot be transferred.

**4.18.2.7. AIRCRAFT INSPECTION PROGRAM.** GACAR § 125.309 lists inspection programs that may be approved for use under GACAR Part 125. The following are permitted by the GACAR:

**A. Continuous Airworthiness Maintenance Program (CAMP).** A Part 125 operator may use a

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maintenance schedule that is a part of a current CAMP approved for use under GACAR Part 121. A CAMP is an all-encompassing program that includes maintenance, inspections, continuing analysis and surveillance, and so forth. All elements are closely related and may not be as effective as “stand-alone” programs. Lack of maintenance and quality control in the airworthiness maintenance program could have negative effects.

**B. Manufacturers’ Inspection Programs .** The operator may use inspection programs currently recommended by the manufacturer of the aircraft, engines, propellers, appliances, or survival and emergency equipment. The manufacturer’s inspection program might not cover survival equipment and avionics equipment. Additionally, the PMI should consider aircraft use before approving a manufacturer’s program. Many manufacturers offer a low-use program if the normal aircraft use falls below certain parameters.

**C. Program Developed by Operator.** The operator may use an inspection program developed itself or by another operator conducting operations under Part 125.

**4.18.2.9. ENGINE MAINTENANCE.** The operator must maintain engines in accordance with (IAW) the overhaul intervals that the manufacturer recommends or as part of the AIP that the PMI approves.

**A. Manufacturer-Recommended On Condition/Trend Analysis Program.** If the manufacturer does not have a recommended overhaul interval, the PMI may approve a program that the manufacturer recommends as an on-condition program/trend analysis program.

**B. Operator-Developed Program.** The operator may develop an on-condition or overhaul program for approval by the PMI.

### **4.18.2.11. CHANGES TO APPROVED TIME INTERVALS.**

**A. Operator-Initiated Changes.** The operator may request approval to amend inspection or overhaul intervals.

- 1) The operator must justify the request using past operating experience, environmental conditions, airplane use, and other data necessary to substantiate changes.
- 2) Teardown reports, manufacturer recommendations, and the operator’s experience may justify engine maintenance programs and overhaul intervals.

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3) Operator-initiated time changes require revisions to both the AIP and OpSpecs.

**NOTE:** Limitations specified for life-limited items and Airworthiness Directives (AD) shall not be amended or extended unless authorized in writing by the Director, Airworthiness Division.

### **B. Manufacturer Escalations.**

1) If a manufacturer extends the recommended inspection or overhaul interval, the operator may request approval to use the extension by submitting a revision to the AIP. The manufacturer's recommendation must accompany the request.

2) PMIs should not automatically approve a time escalation the manufacturer recommends, but should consider the operator's airplane use and experience to ensure that the escalation will not compromise safety. For example, the operator could consider sampling programs to justify time escalation requests.

**4.18.2.13. MAINTENANCE MANUAL.** The operator's maintenance manual must include the AIP. The operator should submit a manual revision (IAW manual revision procedures) at the same time the AIP/revision is submitted for approval. This allows the PMI to approve the AIP/revision and accept the manual concurrently, thus expediting the implementation of the program.

### **4.18.2.15. PREREQUISITES AND COORDINATION REQUIREMENTS.**

#### **A. Prerequisites.**

- Knowledge of the regulatory requirements of GACAR Part 91 and 125
- Previous experience with complex maintenance/inspection programs

**B. Coordination.** This task may require coordination with and/or assistance from the Principal Operations Inspector (POI) and the Airworthiness Engineering Section.

### **4.18.2.17. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References.**

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- GACAR Parts 39, 43, 66, 91, and 125
- FAA AC 20 42 (as amended), Hand Fire Extinguishers for Use in Aircraft.
- FAA AC 20 53 (as amended), Protection of Airplane Fuel Systems Against Fuel Vapor Ignition Due to Lightning.
- FAA AC 20 136 (as amended), Aircraft Electrical and Electronic Systems Lightning Protection.
- FAA AC 91 56 (as amended), Continuing Structural Integrity Program for Airplanes.

### **B. Forms. GAR.**

### **C. Job Aids. None.**

## **4.18.2.19. PROCEDURES.**

### **A. Schedule and Conduct Preliminary Meeting with Operator, (if Necessary).**

- 1) Advise the applicant of regulatory requirements and policies.
- 2) For an existing operator, remind the operator that the maintenance manual must include the AIP/revision.

### **B. Plan and Coordinate Task.**

- 1) Review the operator file to identify any information concerning the AIP/revision and to determine its effect on other programs or procedures that the operator uses.
- 2) If this task is performed as part of an original certification, review the Schedule of Events to ensure that the task can be accomplished IAW the schedule.

**NOTE:** When evaluating the program, ensure that all information is clear and easy to understand. It must identify the scope of each task and provide detailed, step-by-step procedures.

### **C. Evaluate Proposed Program/Revision.**

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1) Evaluate the instructions, procedures, and standards for conducting inspections.

a) The inspection program must include:

- Airframe
- Aircraft engines
- Propellers
- Appliances
- Survival and emergency equipment
- Component parts for the above items

b) When establishing an inspection program, for an aircraft to comply with GACAR § 125.309, the program should include installed avionics and instrument systems (appliances). These systems are not always installed by the aircraft manufacturers and may not be included in their recommended inspection programs.

c) Inspection standards, procedures, methods, instructions, or other technical data may be included in the program by reference, eliminating the need to reprint them. Such references may be either the airframe manufacturer's or the appliance manufacturer's service data. However, when both the airframe manufacturer and the appliance manufacturer provide inspection data that of the airframe manufacturer should be used. In this case, the PMI should ensure that the airframe manufacturer's inspection data is applicable to the actual systems and equipment (make and model) installed on the aircraft.

d) The avionics and instrument systems inspection should include a visual and functional check. Therefore, these definitions should be included in the program:

1. Visual Check. Using acceptable methods, techniques, and practices to determine physical condition and safety items.

2. Operational Check. An operational test to determine whether a system or

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component is functioning properly in all aspects, conforming to minimum acceptable manufacturer design specifications.

3. Functional Check. This test may require the use of appropriate test equipment.

e) Each aircraft inspection program must observe human factors principles.

**D. Evaluate Procedures for Controlling Life-Limited Parts.** The program must contain provisions to ensure that records are current. Life limits must be expressed by one of the following measures:

- Length of time in service
- Number of cycles
- Number of landings
- Calendar time
- A combination of the above measures

**E. Evaluate Procedures for Scheduling Inspections.** The program must list inspection intervals and describe personnel responsibilities for scheduling and performing inspections.

**F. Evaluate Procedures To Ensure Inspections Performed by Properly Certificated Personnel.** Procedures must ensure that inspections are performed by properly certificated, qualified, trained, current, and authorized personnel. The program must identify, by title, the person responsible for ensuring that inspection personnel meet GACA requirements.

**G. Evaluate Engine Maintenance/Overhaul Intervals.** Ensure that engine overhaul periods correspond to the recommended overhaul intervals in the engine manufacturer's manuals and/or service bulletins.

**H. Evaluate Procedures for Reporting and Correcting Mechanical Irregularities.** The program must include detailed instructions, procedures, and the necessary forms and documents for the recording and repair of mechanical irregularities. These instructions, procedures, and forms may appear elsewhere in the company manual, but their location(s) must be referenced in the

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maintenance manual and AIP.

- 1) Within its manual, the operator should establish procedures to address continued operation of an aircraft with interim repairs and Structural Repair Manual (SRM) allowable damage. These procedures should also include provisions for a continuous feedback loop of timely information between the operator, the PMI, GACA Airworthiness Engineers, and the manufacturer.
- 2) Manufacturers' service documents (i.e., maintenance manuals, service bulletins) communicate useful information on alterations, repair inspections, etc. It is the operator's ultimate responsibility to ensure that all design data is approved for use under GACAR Part 21 before implementing manufacturers' advice, recommendations, alterations, repairs, etc., prescribed in service documents. In conclusion, although the manufacturer may provide service documents to the operator upon request that include statements that the data is "DER approvable" or that the manufacturer has no "technical objection" with the operator's request, it is the operator's responsibility to ensure that technical data is approved for use under GACAR Part 21, before implementing the information in these service documents.
- 3) It is recommended that PMIs ensure that this information is brought to their operator's attention. Any conflict should be resolved regarding what constitutes GACA-approved data and when that data is required, regardless of what a manufacturer's service document may say.

**I. Evaluate Instructions for Using AIP.** Make sure the AIP includes instructions on its use.

**J. Analyze Findings.** Evaluate findings to determine if program changes are required. Coordinate with other specialties before debriefing operator.

### **K. Conduct Debriefings.**

- 1) Before meeting with the operator, discuss initial findings with appropriate GACA personnel to determine content of the briefing. Depending on the findings, it may be necessary to coordinate with the certification team, principal PMIs, Airworthiness Engineers, or other GACA personnel.
- 2) Brief the operator on results of evaluation. Discuss any deficiencies.

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### 4.8.2.21. TASK OUTCOMES.

#### A. Complete the GAR.

#### B. AIP/Revision. Approve or Reject the AIP/Revision.

1) For approval if the program or revision meets all regulatory requirements, proceed as follows:

- a) Ensure that the AIP or revision has been fully coordinated between maintenance and avionics and any other appropriate personnel.
- b) Indicate “Approved” by the amended OpSpecs.

**NOTE:** The date the AIP are approved must be the same as the date the OpSpecs are approved.

- c) Initial and date each page of the AIP or revision unless another approval control is used.
- d) Send the approved AIP/revision and the original and one copy of the OpSpecs to the operator, as appropriate.
- e) Update the office file with copies of the acceptance letter, the signed and dated AIP/revision, and the received OpSpecs.

2) For rejection if the AIP/revision is not acceptable, advise the operator by letter that the program is rejected. Return it to the operator along with the reasons for the rejection. Ensure that the letter accomplishes the following:

- Confirms all agreements made during the debriefing
- Identifies the date the AIP/revision was submitted
- Shows the revision number and date
- Identifies and describes all deficiencies by chapter, section, page, etc.

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- Refers each deficiency to the appropriate regulation
- Returns the original AIP
- Reminds the operator not to implement the revision until it is approved

### **4.18.2.23. FUTURE ACTIVITIES.**

**A. Schedule of Events.** In the case of original certification, review the Schedule of Events to determine if a revised schedule is necessary.

**B. Maintenance Manual.** Ensure that the maintenance manual includes the approved AIP/revision.

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### VOLUME 4. AIR OPERATOR AND AIR AGENCY - ADMINISTRATION

#### CHAPTER 18. AIRWORTHINESS PROGRAMS FOR PART 125

##### Section 3. Evaluate Maintenance Inspection Training Program/Records for Part 125

###### **4.18.3.1. GACA ACTIVITY REPORT (GAR).**

A. 3305 (AW) (Training-Initial)

B. 3306 (AW) (Training-Revision)

**4.18.3.3. OBJECTIVE.** This section provides guidance for evaluating a Required Inspection Item (RII) training program.

**4.18.3.5. GENERAL.** General Authority of Civil Aviation Regulations (GACAR), § 125.313 requires that required inspection personnel be properly trained. Effective training is essential to ensure that RII inspections are performed properly. Although procedures for inspecting airplanes may be similar, each operator's program is unique in terms of equipment, procedures, and methods of documenting tasks. Training programs are accepted as part of the Maintenance Manual (MM). The operator must ensure that contractors' personnel are trained according to the operator's procedures.

###### **4.18.3.7. CONTENT.**

**A. Topics.** The training program should cover the following:

- The operator's maintenance manual
- Section of the GACAR that deals with RII requirements
- Methods and techniques to conduct the RII inspections

1) There should be a method for documenting the individual's training record.

2) The operator must have a method to authorize a person to perform the RII inspection. The authorization may be in the form of a listing or an individual card.

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**B. Methodology.** Training consists of formal instruction and/or on-the-job training. Training credit may be given for previous experience on similar type aircraft. However, procedures unique to the operator's RII must be taught.

### 4.18.3.9. TRAINING RECORDS.

**A. Currency.** Training records should be current. They should indicate the content of formal training and on-the-job training. Credit for previous experience must be shown.

**B. Location.** Training records should be retained at the operator's main base, or at other locations listed in the operator's manual, to ensure that all authorized personnel are properly trained before performing RII inspections. The operator is responsible at all times for the accuracy of these records.

**4.18.3.11. EVALUATING A TRAINING PROGRAM.** A training program is evaluated to ensure that persons perform RII inspections with the highest degree of competency. Training received throughout the operator's system must be of equal quality and effectiveness. While the operator's capabilities must be considered, the size of the operation should not influence the need for an effective RII inspection training program

**4.18.3.13. COORDINATION REQUIREMENTS.** This task requires coordination between the involved Airworthiness Aviation Safety Inspectors (Inspectors).

### 4.18.3.15. REFERENCES, FORMS, AND JOB AIDS.

**A. References.** GACAR Parts 43, 66, 91, and 125

**B. Forms.** GAR.

**C. Job Aids.** None.

### 4.18.3.17. PROCEDURES.

**A. Receive the Training Program as Part of a Manual/Revision.**

**B. Evaluate the Content of the Training Program.** The training program for persons performing RII inspections should include the following:

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- Training on the designated RII items listed in the operators MM
- Training on the method of performing the RII inspection
- Training on buy-back procedures of previous RII inspection findings
- Training on the procedures, standards, and limitations for the acceptance or rejection of an RII item
- Training on the operator's procedures for work interruptions on RII inspections
- The name of the person responsible for the overall administration of the RII inspection training
- Procedures for evaluating previous experience and training and providing appropriate credits to records
- Recordkeeping procedures. Records should include the student's name, course title, date completed, instructor's name and signature, the number of hours of training performed, and a notation of whether the course was completed successfully.
- A training syllabus describing the content of course, format of training, duration of training courses, standards for grading students, and training aids

**C. Evaluate the Training Facilities and Equipment.** Ensure that facilities, training aids, and reference material are adequate to support the training program.

**D. Debrief Operator.** Discuss findings, including any deficiencies with the operator. Discuss any need for corrective action.

### **4.18.3.19. TASK OUTCOMES.**

**A. Complete and File the GAR.**

**B. Task Completion.** Completion of this task will result in one of the following:

- 1) Program acceptance, shown by acceptance of the RII training portion of the complete manual

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2) Program rejection, by notifying the operator, in writing, of the reasons for rejection

**C. Document Task.** File all supporting paperwork in the operator's office file.

**4.18.3.21. FUTURE ACTIVITIES.** After accepting an inspection training program, observe training in progress. Evaluate instructors and teaching techniques to ensure that the training program is effective.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 19. MISCELLANEOUS PARTS 61, 65, 66, 91, 121, 125, 129, 135, 141 AND 145 ADMINISTRATION**

##### **Section 1. Operational Emphasis Items**

**4.19.1.1. GENERAL.** This section includes information that is not task specific, but is of importance to aviation safety inspectors (Inspectors) performing both evaluations of operators and during contact with airmen.

##### **4.19.1.3. HAZARDS ASSOCIATED WITH IMPROPER SECURITY OF NOSE SECTION**

**EXTERIOR CARGO DOORS.** Investigation of a fatal accident revealed that the nose baggage door of a twin-engine aircraft opened in flight shortly after takeoff. Eight people died in the ensuing accident. Further investigation revealed a bypass of the safety interlock feature on the nose baggage door sometime before the accident. Therefore, the pilot received no warning that the door was unlocked.

**A. Continued Occurrences.** The continued occurrence of unwanted nose baggage door openings on small twin-engine aircraft indicates that a safety problem still exists with small aircraft that use the nose section as a baggage area.

- 1) The nose baggage doors of these aircraft may have door warning lights located in the cockpit. The warning lights illuminate to indicate an open or unsecured baggage door.
- 2) Some models have a safety interlock feature designed to prevent an engine start if the nose baggage compartment door is not properly latched.
- 3) The warning light system and the safety interlock may become inoperative or one may intentionally bypass the system. When the pilot is not aware of an open or improperly latched nose baggage door, door opening and release of cargo can occur with catastrophic results.

**B. General Authority of Civil Aviation (GACA) Responsibilities.** In all contacts with operators of twin-engine aircraft with nose section cargo storage areas, Inspectors should inform operators and pilots of the hazards associated with improper security of nose section exterior cargo doors.

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- 1) Inspectors should suggest that the operators establish and use a procedure to ensure the security of all exterior cargo doors before flight. The Inspector should also recommend installation of secondary locking devices or cargo restraint systems.
- 2) During inspection of this type of aircraft, an Inspector (Airworthiness) should determine if an installed safety interlock feature is functioning properly or if it has been bypassed. Properly repair malfunctioning warning or safety interlock systems before flight.

**4.19.1.5. AIR TRAFFIC CONTROL (ATC) CLEARANCE READ BACK.** Over the past years, accidents and incidents have occurred because of misunderstandings between pilots and controllers.

**A. Adherence to Communications Procedures.** In all contacts with pilots, instructors, examiners, and pilot schools, Inspectors should emphasize the need for strict adherence to communications procedural requirements.

**B. ATC Read Backs.** During contact with pilots, Inspectors should stress the possible hazards associated with pilot and controller misunderstandings. Clear read back of ATC altitude or heading clearances helps to avoid such misunderstandings.

**4.19.1.7. PASSENGER EMERGENCY BRIEFINGS.** There have been several accident/incidents where the passengers have been injured because of insufficient knowledge of emergency procedures.

**A. Responsibilities of General Authority of Civil Aviation Regulation (GACAR) Part 91 Operators.** Operators of Part 91 aircraft should:

- 1) Ensure that passengers are made aware of emergency procedures before takeoff.
- 2) Ensure compliance with placard requirements.
- 3) Ensure that procedures to stow all loose items in the aircraft before takeoff and landing are in effect.
- 4) Periodically review the accuracy and appropriateness of the passenger briefing cards (if applicable).

**B. GACA Responsibilities.** During surveillance or other contact with Part 91 aircraft operators, Inspectors must stress the importance of briefing passengers on emergency procedures before

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flight.

**4.19.1.9. USE OF MANUFACTURER CHECKLISTS.** Investigation of an accident involving a turbojet aircraft revealed that the flight crew members failed to check the emergency/park brake handle position before takeoff.

**A. Takeoff Crash.** In this accident, an aircraft crashed when the pilot was unable to rotate the aircraft to the proper pitch attitude during an attempted takeoff. Examination of the emergency/park brake lever indicated that the lever was in the “park” position during the takeoff roll.

**B. Manufacturer Checklists.** Comparison of the manufacturer’s suggested checklist with the company’s checklist indicated that the manufacturer’s suggested checklist recommended that the status of the emergency/park brake and associated warning light be checked on three separate occasions before takeoff. None of these checks appeared on the company checklist.

**C. GACA Responsibilities.** Inspectors must review the checklists for high performance turbojet aircraft to ensure that any information or procedures in the manufacturer’s suggested checklist are included in the checklist used by the flight crew.

### **4.19.1.11. ALTERNATE AERODROMES FOR HIGH ALTITUDE INSTRUMENT FLIGHT RULES (IFR) OPERATIONS.**

**A. High Altitude Aerodromes.** There are many high altitude aerodromes in the world with approved instrument approach procedures (IAP) where the Minimum Descent Altitude (MDA) is greater than 2,000 feet above ground level (AGL) and/or the landing visibility minimums are greater than 5 km. This could result in a critical situation if the weather is marginal and a pilot has failed to plan for a suitable alternate aerodrome.

**B.** GACAR § 91.181(b) permits a pilot to avoid the alternate aerodrome fuel requirement. This provision is dependent upon the ceiling at the estimated time of arrival (ETA) over the aerodrome of intended landing. The weather forecast, for at least 1 hour before and 1 hour after landing, must be at least 2000 ft (600 m) above the aerodrome elevation and the visibility must be at least 5 km.

**C. GACA Responsibilities.** During surveillance or other contacts with pilot groups, especially in high altitude areas, Inspectors should stress the need for a careful review of the instrument approaches to aerodromes located in mountainous terrain with respect to minimum altitudes and

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aircraft avionic equipment capability. Inspectors should recommend that pilots consider the need for enough fuel to divert to an alternate aerodrome even when the weather forecasts are at or above the minimums for waiving this requirement.

- 1) A number of aerodromes have minimum altitudes below 2,000 feet (600 m) and 5 km for some IAPs that require special equipment such as a glide slope or distance measuring equipment (DME). All other IAPs at these aerodromes have MDAs above the required minimum ceiling for foregoing the necessary fuel to reach an alternate. If there is no special equipment installed or it becomes inoperative, and the ceiling is as forecast, about 2,000 feet (600 m)AGL, the situation may necessitate the pilot declare an emergency under instrument conditions at the destination aerodrome.
- 2) A number of aerodromes have MDAs that are slightly (100 feet to 200 feet) below 2,000 feet (600 m) AGL. In situations when the weather is forecast to be 2,000 feet (600 m) ceiling and/or 5 km visibility, a pilot may find, upon arrival, that the weather is somewhat less than forecast. If a missed approach was necessary and the prospects of the weather improving were slim, the pilot who had not included enough fuel to get to a suitable alternate might become involved in an emergency situation.

**4.19.1.13. HAZARDS ASSOCIATED WITH CARRIAGE OF CARGO PACKED IN CARBON DIOXIDE.** An incident involved a Falcon Jet's flight crew members who experienced dizziness and shortness of breath while awaiting takeoff clearance. Investigation revealed that the cargo on board the aircraft included items packed in solid carbon dioxide CO<sub>2</sub>, also known as dry ice. The crew was confined in an unventilated cabin for approximately 10 minutes. The flight returned to the ramp, and the crew recovered after exiting the aircraft. The dry ice was off-loaded, and the flight departed without further incident. Subsequent investigation revealed that crew members on other flights had also experienced these symptoms when carrying dry ice.

**A. Dry Ice as a Hazardous Material (hazmat).** Dry ice, usually in a snow-like consistency, refrigerates food, medicine, and other perishable items. Dry ice is a solid under the dangerous good regulations of GACAR Part 109.

- 1) When transported by aircraft, contain solid carbon dioxide, a hazmat, in packaging designed and constructed to permit the release of carbon dioxide CO<sub>2</sub> gas.
- 2) One of the factors affecting the sublimation rate of this gas is the surface area of the solid carbon dioxide. The snow-type consistency of dry ice causes gas to sublimate at a much

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higher rate than carbon dioxide in blocks. The rate of CO<sub>2</sub> release varies with the degree of insulation used in packaging, crushed or solid form of carbon dioxide, temperature, and atmospheric pressure.

3) CO<sub>2</sub> is a simple asphyxiate. When conditions are high enough that there is insufficient oxygen in the atmosphere to support life, symptoms of asphyxiation may result. The signs and symptoms are those that precede asphyxia; headache, dizziness, shortness of breath, muscular weakness, drowsiness, and ringing in the ears. Immediate removal from exposure generally results in rapid recovery.

**B. Hazards of Dry Ice Onboard Aircraft.** The hazard associated with the carriage of dry ice aboard all aircraft is minimal under most cabin ventilation conditions or settings. However, the concentration of CO<sub>2</sub> in an unventilated cabin area the size of a Falcon Jet or smaller can be significant. The cabin air rate of change per hour should be positive to prevent unwanted CO<sub>2</sub> concentrations when carrying dry ice. While this hazard is greater during ground operations, it is possible to have a CO<sub>2</sub> buildup in the cockpit/cabin area during flight. The buildup could be greater during periods requiring less ventilation, such as cool weather operations with the vents closed and only a small amount of heat applied.

**C. GACA Responsibilities.** Inspectors should contact pilots and certificate holders who they know carry cargo packed with dry ice and discuss this issue.

1) GACA recommends that pilots operating aircraft with a cabin volume the size of the Falcon Jet or smaller, which are not capable of forced ventilation while on the ground, be aware of this hazard and initiate procedures to ensure there is no impairment to their ability to function. One positive solution is the use of 100 percent oxygen by the crew while taxiing and holding the aircraft before takeoff.

2) Pilots of unpressurized small aircraft carrying dry ice should be aware of the possibility of CO<sub>2</sub> buildup during en route operations. If pilots suspect any CO<sub>2</sub> asphyxiation symptoms, they should increase the cabin ventilation. Pilots should also consider landing as soon as practical if the symptoms continue.

3) Operators who need to carry large quantities of dry ice over long distances may wish to evaluate or monitor cockpit conditions. There are many types of CO<sub>2</sub> detection devices available.

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**4.19.1.15. FLAP OPERATION ON HS-125 AIRCRAFT.** Two incidents involving flap spar damage caused by flap contact with snow and/or slush during landing have prompted a need to re-emphasize compliance with the applicable instructions contained in the Hawker Siddeley Flight Manual.

**A. Lift-Dump Position.** In each incident, the stress and resulting overloads were imposed when the flaps were deployed to the 75 degree or “lift-dump” position. In one case, damage to the flaps and flap spars created an additional hazard by the lateral movement outboard of the damaged flap, which in turn damaged the adjacent aileron.

**B. Crew Manual Changes.** The Hawker Siddeley Company has incorporated the following instructions in the Flight Manuals of Hawker Siddeley HS-125 models 3AR, 3ARA, 400, 600, and 700 when operating on a runway with deep puddles, slush, snow, or ice.

- 1) Ensure as far as possible that the landing does not result in a go-around after touchdown.
- 2) After every such landing or aborted takeoff, avoid retracting the flaps, if possible. Examine the top and bottom surfaces of the flaps and adjacent structures for damage, preferably with the flaps in the lift-dump position. Also, ensure that there is no packed slush, snow, or ice between the flap and wing structures.
- 3) If the flaps are confirmed as damaged after examination, report the fact to the person responsible for the aircraft’s maintenance at the first convenient opportunity but not later than the next Service A, inspection. Examine each flap inboard hinge bolt for signs of overloading.

**C. GACA Responsibilities.** Inspectors should contact all known operators of the HS-125 models indicated above and advise them of the hazards associated with operations onto snow or slush covered runways with this type of aircraft. Request that operators review the specific instructions in the crew flight manual regarding this hazard with their flight crews.

**4.19.1.17. LANDING ON WET OR SLIPPERY RUNWAYS.** Water, ice, or snow on a runway can seriously affect aircraft ground controllability and braking efficiency. In the case of standing water, as the speed of the aircraft and the depth of the water increase, the water layer builds up an increasing resistance to displacement, resulting in the formation of a wedge of water beneath the tire. The vertical component of this resistance progressively lifts the tire, decreasing the area in contact with the runway until, with certain aircraft configurations and water depths, the tire is completely out of contact with the runway surface and starts hydroplaning on a film of water. In this condition, the tires

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no longer contribute to directional control, and braking action is nil.

### A. Types of Hydroplaning.

- 1) *Dynamic Hydroplaning.* The presence of standing water on the runway surface (about 0.25 cm deep) acts to lift the tires off the runway causing dynamic hydroplaning to occur.
- 2) *Viscous Hydroplaning.* Viscous hydroplaning occurs because of the viscous properties of water. The tire cannot penetrate a thin film of fluid more than 0.0025 cm deep and the tire rolls on top of the film. Viscous hydroplaning can occur at a much lower speed than dynamic hydroplaning, but requires a smooth surface.
- 3) *Reverted Rubber Hydroplaning.* Reverted rubber hydroplaning requires a prolonged, locked wheel skid, reverted rubber, and a wet runway surface. Rubber that has reverted to the surface during previous landings contaminates most runways. This reverted rubber acts as a seal between the tire and the runway and delays water exit from the tire footprint area. The water heats from friction becoming steam, and the steam supports the tire off the pavement.

**B. Hydroplaning Tests.** From the data obtained during hydroplaning tests, the minimum dynamic hydroplaning speed of a tire has been determined to be 8.6 times the square root of the tire pressure in pounds per square inch (PSI). For example, the LearJet main tire has a pressure of 115 PSI, and its calculated hydroplaning speed is 92 knots. It is important to note that the calculated speed is for the start of the dynamic hydroplaning. Once hydroplaning has started, it may persist to a significantly slower speed, depending on the type of hydroplaning.

- 1) A joint FAA/National Aeronautics and Space Administration (NASA)/United States Air Force (USAF) Runway Research Program was conducted in the U.S. to establish the degree of stopping distance correlation between jet aircraft and ground-friction measurement vehicles.
- 2) Although the aircraft used for the program were transport category aircraft (B-727 and DC-9), because of these tests, the following general procedures are suggested when landing any aircraft on slippery or wet runways:
  - a) Fly a stabilized approach without excessive airspeed. Touchdown at the proper point and avoid holding the airplane off.

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- b) If it is not possible to establish a zero drift condition before touchdown, execute a missed approach.
- c) If available, activate the spoilers as soon as possible after main gear touchdown. With automatic spoiler systems, be prepared to deploy the spoilers manually.
- d) Immediately lower the nose wheel to the surface and maintain wheel loading by forward pressure on the control column.
- e) If available, apply reverse thrust on all engines.
- f) Maintain directional control, primarily with rudder and nose wheel steering. Use differential braking as needed.
- g) Apply light to moderate brake pedal pressure.
- h) If directional control becomes a problem while in reverse thrust, reduce reverse thrust on all engines and, if necessary, return them to forward thrust.
- i) Do not attempt to turn off a slippery runway until reducing speed sufficiently to turn without skidding.

**C. GACA Responsibilities.** Inspectors with program responsibility for airman certification and testing should review the adequacy of pilot training and competence with respect to landing on slippery runways and the phenomenon of hydroplaning. Pilot training programs should cover these subject areas with emphasis on the operational procedures that are essential to a successful landing (i.e., speed control (stabilized approach), touchdown point, and the use of spoilers/speed brakes, wheel brakes (including use of anti-skid limitations), and reverse thrust).

### **4.19.1.19. COMPUTING RUNWAY LANDING AND DECELERATION REQUIREMENTS.**

**A. Accident History.** In an accident, a LearJet overran the end of a runway, traveled off a 25 m bluff, and was destroyed by impact and fire. The accident killed four passengers and two crewmembers. The runway was 1000 m long and 30-m-wide with 35 m displaced thresholds. The approved flight manual for the LearJet indicated a requirement of 945 m for landing distance based on Aerodrome elevation, runway gradient, temperature, and wind at the time of the accident.

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**B. GACA Responsibilities.** Inspectors should contact operators of transport category aircraft in general aviation operations and discuss the use of minimum landing runway lengths that will provide the safety margin required by GACAR Part 121 or 125. If it is not possible for general aviation operators to use these safety margins, the Inspector should encourage the operator to establish the use of safety margins consistent with the performance of the emergency braking system of the aircraft.

- 1) It is important for pilots to preplan for brake failures, including decisions to abort a landing after touchdown.
- 2) Review the use of emergency brakes and other deceleration devices during preflight planning.
- 3) Many transport category aircraft have performance charts included in the aircraft flight manual. These performance charts depict minimum landing distance with the margins required by Part 121 and 125 already calculated. Encourage the use of these charts, since use of the more conservative values when flight planning will result in crews choosing runways with a greater margin of safety.

**4.19.1.21. ALTIMETER SETTINGS FOR BAROMETRIC PRESSURE ABOVE 31.00 INCHES HG.** There is no need to test altimeters for barometric pressures exceeding 31.00 inches of Hg. Most are not capable of an adjustment exceeding this value.

**A. Characteristics of High Barometric Pressure.** The Air Traffic Procedures Advisory Committee (ATPAC) in the U.S., identified a need to ensure common pilot/controller understanding of aircraft operations in areas where the barometric pressure exceeds 31.00 inches Hg. The committee recommended that the aviation community be aware of the effects of high barometric pressure on aircraft operations.

- 1) The atmospheric conditions that produce barometric pressures in excess of 31.00 in. Hg are a cold, dry air mass, and associated ceiling and visibility that is essentially unlimited except for local conditions such as smoke or ice fog.
- 2) When the actual barometric pressure is greater than the altimeter setting, the indicated altitude will be lower than the actual altitude. The effect of cold temperature is in the opposite direction. It is noted that the two variables, pressure and temperature, tend to

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nullify each other.

**B. GACA Responsibilities.** Inspectors should ensure that the aviation community is aware of the AIP material and the effects it has on their operations. Place special emphasis on advising operators at remote aerodromes that it may not be possible to set field elevation before departure when these atmospheric conditions exist.

**4.19.1.23. OPERATION ON CLOSED RUNWAYS/TAXIWAYS.** Reports of aircraft operating on closed runways/taxiways indicate a need for increased emphasis on the potential problems associated with this type of operation.

**A. Notification of Conditions Affecting Safety.** Aerodrome operators are responsible for establishing and using procedures for the immediate notification of aerodrome users and the GACA of any conditions adversely affecting operational safety.

1) Aerodrome operators have the authority to close an aerodrome, or any of its runways, when they determine an area to be unusable or unsafe for aircraft operations. Aerodrome operators are the primary authority for originating, by Notice to Airmen (NOTAM) or other means, information to airmen concerning unsafe conditions or other operational limitations on their aerodromes.

2) In the case of aerodromes certificated under GACAR Part 139; the regulation requires dissemination of information concerning aerodrome conditions affecting safe aircraft operations to operators of the aerodrome.

**B. Operations During Closure.** Aerodrome operators have reported instances of aircraft operations on their aerodromes contrary to the notices of closure or other restrictions because of unusable or unsafe conditions. The aerodromes involved have been both certificated and non-certificated aerodromes. The aircraft involved have been both air carrier and general aviation aircraft.

**C. Accident History.** Analyses of past accidents and incidents have identified the following situations that have contributed to hazardous operational conditions on aerodrome areas:

- 1) Holes, obstacles, loose pavement, or debris on or near operations areas,
- 2) Heavy equipment, stationary or mobile, operating near aerodrome operations areas or in

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safety areas,

- 3) Relatively low visibility units such as cranes, drills, and the like in critical areas such as approach zones,
- 4) Crews of workers, who may not be highly visible, near runways or taxiways,
- 5) Mounds of earth, construction material, temporary structures, and other obstacles in proximity to operations areas and approach zones, and
- 6) Safety area encroachments, improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces.

**D. Permanent Runway/Taxiway Closings.** When an aerodrome operator permanently closes a runway or a taxiway, the lighting circuits are disconnected. On a closed runway, the threshold markings, runway designation marking, and touchdown zone (TDZ) markings are obliterated and crosses placed at each end and at 300-m intervals and at each entrance of a closed taxiway.

### **E. Temporarily Closed Runways/Taxiways.**

- 1) Temporarily closed runways are generally treated in the same manner as permanently closed runways, but without obliterated markings. Temporary crosses are normally only placed at the runway ends on top of the runway numbers.
- 2) The use of barricades with alternate orange and white markings, supplemented with flags, indicates temporarily closed taxiways. For night operations, flashing yellow lights are generally used.
- 3) During night operations, an aerodrome with a closed/obstructed runway may still have the aerodrome rotating beacon in operation.
- 4) Identification of temporary runway threshold displacements are normally located outboard of the runway surface. This could include outboard lights, runway end identification lights (REIL), and markings.

**F. Pilot Expectations.** If a NOTAM has not been issued advising that a runway is closed, and if there is no information to the contrary, a pilot should be able to expect that the runway is free of

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unusual conditions of a hazardous nature. However, if a NOTAM has been issued advising that the runway is undergoing maintenance and the entire surface is unusable or unsafe, the pilot has no way of knowing what hidden defects the pavement may contain or what sort of activity may suddenly occur on a previously unoccupied portion of the surface.

**G. Closed Runway Information.** When a runway or other area will close, the aerodrome operator provides information to the local ATS facility so that one may issue a NOTAM.

**H. GACA Responsibilities.** When a report of, or a complaint about, an aircraft operating on a closed runway or other aerodrome surface is received, the Inspector should make a record of the complaint in detail (refer to Volume 13, Chapter 2, Section 1, Conduct a Complaint Investigation).

- 1) The Inspector should record as many specific details as possible in order to determine if a hazardous operation took place.
- 2) The follow-up investigation should be conducted with an emphasis on the competency of the airman involved (e.g., recognition of hazardous situations, awareness of conditions affecting the operation, and ability to obtain information necessary for conduct of safe operations). If necessary, the Inspector should begin the enforcement investigation (refer to Volume 13, Chapter 2, Section 1, Conduct a Complaint Investigation).
- 3) During routine contact with airmen (participation in safety seminars, pilot counseling, flight instructor seminars, discussions with pilot schools, etc.), Inspectors should disseminate this information and offer appropriate cautions, while emphasizing that the safety of any flight is ultimately the responsibility of the PIC.

### 4.19.1.25. SIMULATED RUNAWAY PITCH TRIM TRAINING.

**A. Training Dents.** Accidents involving transport category aircraft indicate that a simulated runaway pitch trim training exercise may have been a factor. Concern centers around the methods and technique used to conduct the training.

- 1) At high airspeeds, it is less desirable to hold a simulated runaway nose-down trim condition for a length of time that would allow the trim drive unit to reach the design limits.
- 2) At low airspeeds or high drag configurations such as landing or climb, it would be

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undesirable to continue trimming to the nose-up trim limit.

3) In either configuration, the activation of lift-dump devices would deteriorate the aircraft's handling qualities.

4) Technique and judgment are the key elements when conducting this type of training.

**B. Inspectors' Actions.** Inspectors, whose duties include conduct of pilot certification and pilot proficiency flight checks, should review operator's techniques and procedures for simulated runaway pitch trim training. Trim impulse should not exceed three seconds duration, nor should any simulated runaway pitch trim exercise be introduced at a speed above 250 knots or below an altitude of 12,000 feet AGL. Inspectors should also inform pilot examiners and operators of transport category aircraft of the precautions they must employ associated with simulated runaway pitch trim training, with emphasis on the parameters discussed in this paragraph.

### **4.19.1.27. USE OF ATS SERVICES DURING NIGHT/MARGINAL VISUAL FLIGHT RULES**

**(VFR) CONDITIONS.** The use of ATS services may reduce the potential for in-flight, terrain type accidents and in turn greatly enhance safety.

### **4.19.1.29. PROPER IDENTIFICATION AND PROCEDURES DURING IN-FLIGHT ENGINE FAILURES.**

**A. Incident History.** Incidents where the flight crews improperly identified and reacted to cockpit light indications stressed the need for this guidance. One event occurred during an approach when an engine ignition light came on. Without further verification, the flight crew assumed that the engine had failed and continued the approach. During the attempted single-engine missed approach, the flight crew lost aircraft control and crashed. Communications between the pilots during this accident indicated lack of situational awareness as well as misidentification of the problem. It would have been possible to avoid this accident, if the flight crew correctly analyzed the situation and took proper corrective action. Once they incorrectly assumed the engine had failed, the crew then complicated the situation by failing to accomplish the correct engine shutdown procedures and plan for a single-engine approach. The investigation revealed that during training the only time the crew experienced an illuminated ignition light was in conjunction with an engine failure. Flight crews received no exposure to circumstances that may cause the ignition light to illuminate, other than an engine failure, during training. This may have conditioned the crew to regard the light only as an engine failure event.

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**B. Following the Emergency Checklist.** In a separate event, the crew was confronted with an illuminated start valve light, followed by fire indication lights shortly after takeoff. The crew only completed the first two steps of the emergency procedure checklist (auto throttle: off and throttle: idle), before stopping to brief the cabin crew members. Failure to complete the engine fire shutdown procedure in a timely manner led to additional problems during the subsequent approach and landing. Although a captain may do whatever he or she judges most important to mitigate an emergency situation, given the information available to the flight crew at the time, it is important to stress that interrupting an emergency checklist should be strongly discouraged as a matter of safety policy unless a greater emergency exists. This advice applies in any type of operations, including single pilot operations.

**C. GACA Responsibilities.** Inspectors responsible for approving and reviewing training programs are encouraged to review their operator's training curriculums for emphasis of the following points:

- 1) Initial and recurrent training programs should provide a broad range of engine failure scenarios, including failures that one may misinterpret as an engine failure.
- 2) Once the flight crew verifies an engine failure, they should take action to accomplish the correct shutdown checklist and properly plan for an engine-out approach and possible go-around.
- 3) Emphasize the importance of the emergency/abnormal checklist. Completion of the checklist should be deliberate and methodical; the checklist should not be rushed or interrupted for routine events until it has been completed.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 19. MISCELLANEOUS PARTS 61, 65, 66, 91, 121, 125, 129, 135, 141 AND 145 ADMINISTRATION**

##### **Section 2. Acceptance and Renewal of Inspection Authorization Refresher Training for Part 66**

**4.19.2.1. GENERAL.** This section pertains to reviewing, accepting, and/or renewing refresher training (course) acceptable for Inspection Authorization (IA) renewal under the General Authority of Civil Aviation Regulations (GACAR) § 66.83(a).

**A. Inspection Authorization (IA) Renewal.** Mechanics with IAs who wish to use training to renew their IAs under GACAR § 66.83(a) must present evidence of acceptable training to the General Authority of Civil Aviation (GACA).

**NOTE:** To be eligible for a 1-year renewal of an inspection authorization an applicant must present evidence to the President during the month of March of each year, that the applicant still meets the requirements of GACAR §§ 65.63(c)(1) through (4).

##### **4.19.2.3. DEFINITIONS.**

**A. Training Provider/Sponsor.** An individual or an organization holding a course found acceptable by the GACA and providing training events that meet requirements of IA renewal training under GACAR § 66.83(a).

**B. Training Course Outline (TCO).** A course outline showing the course curriculum or subject areas to be presented along with references to any technical or regulatory related material as a part of each presentation to include the length of presentation times for each curriculum or subject area planned for delivery.

**C. Curriculum.** The content of the course of instruction consisting of objectives, course material, presentation methods and evaluation used to include copies of tests and samples of visual aids, if applicable.

**D. Distance Learning, Web-based or Out-Study Curriculum.** A curriculum that accomplishes the presentation, completion, and applicable testing for all course materials: correspondence, online, individual computer-based, or a combination thereof.

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**E. Webinar.** A curriculum that satisfactorily accomplishes the transmission of a live presentation to remote locations via various video/audio transmission means, the presentation, completion, and applicable testing for all course materials.

**F. Training Syllabus.** Syllabus documents that contain recommended course elements or subject areas that the course provider must cover when developing a training curriculum that the GACA will accept and be presented for IA training. These syllabus or subject areas are available within GACAR Part 147.

### 4.19.2.5. POLICY AND GUIDANCE.

#### A. Authority to Review, Accept, or Reject IA Renewal Training.

- 1) It is the responsibility of the appropriate GACA aviation safety inspectors (Inspectors) to review, accept, renew, or reject all course material submitted by industry and the aviation community.
- 2) For a period of 36 months after a course expires or is on suspension, the approving Inspector will maintain an electronic file of all reviewed letters of request and training materials.
- 3) The Inspector will submit any unconventional or nontraditional delivery (new technology) methods of providing IA renewal training to the Manager, Airworthiness Division, to determine whether the method of delivery is acceptable. After it is determined that the method of delivery and process is acceptable, the Inspector will review the course content for acceptance. Review of these type courses will require a 90 working day timeline addition.

#### B. Responsibilities and Limitations.

- 1) All courses submitted with the intent of meeting the requirements of GACAR § 66.83(a), IA refresher training will consist of regulatory requirements, GACA policy, and/or maintenance training that directly relates to maintenance, inspection, repair, or alteration of aircraft products, systems, components, and/or accessories. All training will possess some curriculum subjects covering the training syllabi course elements found in GACAR Part 147 appendices and/or relevant to IA responsibilities (e.g., maintenance publications,

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mechanic privileges, and limitations, etc.). Additionally, the GACA may decide to accept courses that focus on human factors and safety management systems produced against the respective syllabus. However, the GACA will only accept a maximum of 6 hours credit for human factors training for IA renewal.

2) An applicant may submit the TCO for acceptance, with topics presented in various forms: modular increments of 1 hour, full designated-time course, and/or a combination. This allows flexibility of schedule and presentation at various locations worldwide, including computer-based programs. A 1-hour session is a minimum of 50 minutes to allow for breaks. Courses can exceed 8 hours, but the GACA will accept only 8 hours for IA renewal credit.

**NOTE:** The GACA will not accept course topics less than 50 minutes.

3) Operators and agencies conducting technical, safety management system, and/or human factors training and requesting IA refresher acceptance must submit and obtain a course number in accordance with this guidance.

4) GACA will accept, without additional review or further showing, maintenance technical training conducted by a manufacturer or its authorized representative on its product for the purpose of IA renewals. These entities, however, must meet all the training requirements of this section with the exception of submitting for acceptance and obtaining a refresher course acceptance number.

5) GACA Director, Certification and Licensing Division may appoint Inspectors to organize and provide IA renewal training addressing current issues concerning IAs without additional course acceptance. These events will consist of GACA presenters and may be supplemented by maintenance entities and industry representatives who can contribute effective materials in providing information that can substantially mitigate accident/incident risks. All training requirements of this section must still be met.

6) The training received must be documented in the form of a Training Certificate and attendance roster, indicating the individual's name, length of training, date presented, and GACA management representative's signature. This training will be considered acceptable for IA renewal purposes.

7) The GACA will not accept the following courses for review nor will the following courses be accepted to meet the training requirements of GACAR § 66.83(a):

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- a) Manufacturers/air carrier training designed for pilots such as an overview of systems operation; and
- b) Programs/courses that promote or sell products.
- c) Familiarization courses such as company maintenance employee orientation training that deals with a majority of non-technical subjects such as company “non-maintenance” procedures, manuals and administrative procedures are examples.

### C. Application Process and Course Review.

1) Presently, an applicant who desires to have his IA renewal course accepted by the GACA must make initial contact with the Manager, Airworthiness Division. The Manager will appoint an Inspector to contact and direct applicants to where they must submit their IA refresher training course material for review.

**NOTE:** Applicants should allow 60 working-days for the Inspector review/acceptance process.

2) All training courses taught outside the Kingdom of Saudi Arabia (KSA) with the intent of meeting GACAR § 66.83(a) IA renewal requirements must meet all requirements of this section and be in a location suitable for GACA oversight.

3) If for any reason the GACA determines that IA refresher course is unacceptable, the GACA will remove it from the list of acceptable training courses. The training provider will receive notification of such suspension and removal.

4) If the GACA finds discrepancies after investigating a report of poor performance, they will temporarily suspend the course from the list of accepted courses and notify the course provider to cease presentations until they make the acceptable corrections. If the course provider does not implement satisfactory corrections within 15 days of notification, they will receive notification of the course removal from the list of acceptable training courses.

### D. Renewal Request.

1) Submit a request for refresher course renewal 60 working-days before expiration of previous GACA acceptance. If the training provider does not provide timely submission,

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the GACA will remove the course from the list of acceptable courses and consider it inactive. The renewal request will restate the name, address, e-mail address, and telephone number of the training provider or sponsor requesting renewal of their course. Also include a copy of the previous letter of acceptance and/or the assigned course number with the request.

2) Highlight any updates, alterations, and deletions as defined in paragraph F below in some manner, (e.g., change bars, shading, and/or synopsis). If changes are significant, then submit an initial letter of request and all requirements. The GACA may assign a new course number.

### **E. Course Changes.**

1) Minor changes are defined as changes not exceeding two updates, alterations, and/or deletions and must be less than 5 minutes in duration for each hour of the original course material presentation. You may accomplish these minor changes without further acceptance but must designate the changes during renewal.

2) Significant changes are defined as changes consisting of major updates, alterations, and/or deletions in course instructors, subjects, and changes over 5 minutes of each hour of existing subject. Resubmit a complete initial letter of request along with the completely revised course.

### **F. Duties and Responsibilities of the Training Provider/Sponsor.**

1) Revise instruction material/course content in a timely manner and assume full responsibility for the accuracy of the course material.

2) Maintain a list of attendees and contact address for each course given for at least 36 months after the date the training was provided. Make this list available to any GACA upon request.

3) Notify the GACA of the date, time, and location 30 days before the date the IA renewal course is presented in the applicable region.

4) Allow, at no charge, a minimum of one GACA Inspector admission to any session presented to ensure compliance with the regulatory requirements of GACAR § 66.83(a) IA

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renewal training. The inspector must provide a written report detailing any negative findings to the GACA for appropriate action within 10 days of course observation.

5) Provide to the GACA Inspector monitoring the course at least one copy of any materials that the attendees of the training receive. A GACA Inspector attending a training course in any official capacity is not responsible to endorse or provide a Certificate of Training to the course attendees. The Inspector attending the course in any official capacity will not receive a Certificate of Training.

6) For Distant Learning, Web-based, or Out-Study Curriculum, provide required access for GACA acceptance review and program monitoring.

7) Ensure each attendee receives a Certificate of Training showing the training provider name, course name, name of attendee, course identification number assigned, date of attendance, total training hours, acceptable IA creditable hours, and the training provider's signature and affiliation.

**NOTE:** The Certificate of Training must distinguish between total course hours and the hour amount the GACA accepted for the IA refresher training course.

8) Keep course subject/training materials current at all times, and must maintain records of attendees for 36 months after the date of the training.

9) Perform all training in accordance with the submitted and accepted course kept on file with the GACA.

10) Only conduct refresher training under a current accepted refresher course number, if applicable.

11) Cease presentations when notified that the GACA has suspended or removed the course from the accepted list.

### **4.19.2.7. PREREQUISITES AND COORDINATION REQUIREMENTS.**

**A. Prerequisites.** Requires knowledge of GACAR Part 66.

**B. Coordination.** None.

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### **4.19.2.9. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Part 66

#### **B. Forms.** None.

#### **C. Job Aids.** None.

### **4.19.2.11. PROCEDURES.**

**A. Review Request for Initial or Renewal Acceptance of IA Refresher Course.** The Inspector should ensure that the applicant's submission of information included with the letter of request contains all required information.

#### **B. Successful Review.**

- 1) Upon successful review of the course material, the Inspector will provide the applicant a letter of acceptance (LOA) (refer to Figures 4.19.2.1 and 4.19.2.2), assigning a number to the course.
- 2) The GACA will advise the new applicant that a copy of the LOA must be available for inspection by the GACA and attendees at each training session. The letter will also state that the course will have acceptance for IA renewal for 24 calendar-months from the date of the letter. The Inspector will maintain required files at his office work location.

#### **C. Unsuccessful Review.**

- 1) The Inspector will notify the applicant by providing a letter of non-acceptance per the sample in Figure 4.19.2.4.
- 2) Within the non-acceptance letter, state the option of reconsideration.

#### **D. Renewal Requests.**

- 1) Submit a request for refresher course renewal 60 working-days before expiration of the previous GACA acceptance. If the training provider does not provide timely submission,

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the GACA will remove the course from the list of acceptable courses and considered inactive. The renewal request will restate the name, address, e-mail address, and telephone number of the person or organization requesting renewal acceptance of their course. Also include a copy of the previous letter of acceptance and/or the assigned course number with the request.

- 2) If you request a course number before expiration, it will remain the same. If the course has expired, resubmit the initial letter of request and all requirements.
- 3) Highlight any updates, alterations, and deletions in some manner, (e.g., change bars, shading, and/or synopsis). If changes are significant, submit an initial request and all requirements. The GACA may assign a new course number upon review of changes made by the Inspector.
- 4) The Inspector will issue a Letter of Renewal (see Figure 4.19.2.3).

**E. Poor Performance or Suspension.** If an Inspector determines that a training provider/sponsor is conducting courses with material that is outdated or unlike the description, or the performance of the instructor is poor, the Inspector must take the following actions:

- 1) Notify the training provider/sponsor responsible for the course and request an explanation of the Inspector's finding.
- 2) If discrepancies are found, the GACA Inspector will temporarily suspend the course from the list of accepted courses and notify the course provider to cease presentations until acceptable corrections are made. The Inspector will determine the cause of the problems and ensure the training provider/sponsor implemented solutions such as changes or revisions to the course or enlisting a new instructor so the course meets requirements. The Inspector must receive an adequate response and corrections within 30 days of notification.
- 3) If the Inspector receives a less than adequate response or the training provider refuses to make all of the required changes to the course within 30 days of initial notification, then the Inspector will notify the training provider/sponsor by certified mail that the GACA is no longer accepting the provider's course effective on the date they received the certified letter (see Figure 4.19.2.5). The training provider/sponsor may petition for reconsideration under the appeal provisions of GACAR Part 13.

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4) If the Inspector suspends the course for not meeting the acceptance criteria, the training provider/sponsor must notify all attendees who enrolled at the time of poor performance notification and any subsequent presentations the provider may have conducted after notification. Notify the attendees of the course provider's suspension, and the invalidation of credit.

### **4.19.2.13. TASK OUTCOMES.**

**A. Course Acceptance/Renewal.** This task may result in the training provider's (applicant's) course acceptance/renewal and IA's renewal after the completion of the GACA-accepted training course requirements.

**B. Course Denial.** This task may result in the training provider's (applicant's) denial of the submitted IA renewal training course.

### **4.19.2.15. FUTURE ACTIVITIES.** None.

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### Figure 4.19.2.1. Sample Letter of Acceptance

[Date]

[Name]

[Title]

[Address]

Dear Sir:

The General Authority of Civil Aviation (GACA) is pleased to notify you that we have accepted the 8-hour course titled, “IA Renewal Course” that you submitted for Inspection Authorization (IA) refresher training. As of this date, the material submitted meets the requirements of the General Authority of Civil Aviation Regulations (GACAR) § 66.83(a) for IA renewal. Your assigned program identification number is C-INDUSTRY-MI-070116-K-005-01. Your course will remain on the GACA’s active list of accepted IA renewal courses for 24 calendar-months unless suspended or removed for cause.

As a training provider of a GACA-accepted course, your course acceptance is effective for 24 calendar-months. Before the end of the time period, you must provide the GACA Director of Certification and Licensing with a request for course renewal acceptance in accordance with current guidelines. If you do not provide this request at least 60 working-days before the end of the 24-month period, we will remove your course from the list of acceptable courses.

As a presenter of a GACA-accepted IA training course, you must comply with current guidance to remain valid. Your course is subject to GACA review. If the reviewing Inspector determines that your course does not meet the guidelines, you will receive notification.

Your GACA-accepted course number, C-INDUSTRY-MI-070116-K-005-01, will expire on September 30, 2014. Congratulations, and should you have further questions, please contact me at (xxx) xxx-xxxx.

Sincerely,

Manager, Airworthiness Division

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### **Figure 4.19.2.2. Sample Letter of Acceptance Foreign Course Provider**

[Date]

[Name]

[Title]

[Address]

Dear Sir:

The General Authority of Civil Aviation (GACA) is pleased to notify you that we have accepted the course titled, “Human Factors in Aviation Maintenance” that you submitted for Inspection Authorization (IA) refresher training. As of this date, the material meets 6 hours toward the requirements of General Authority of Civil Aviation Regulations (GACAR) § 66.83(a) for IA renewal. Your assigned program identification number is C-INDUSTRY-MI-070116-K-005 01. Your course will remain on the GACA’s active list of accepted IA renewal courses for 24 calendar-months unless suspended or removed for cause.

As a training provider of a GACA-accepted course, your course acceptance is effective for 24 calendar-months. Before the end of the 24 calendar-month period, you must provide the appropriate GACA manager with a request for course renewal acceptance in accordance with current guidelines. If you do not provide this request at least 60 working-days before the end of the 24-month period, we will remove your course from the list of acceptable courses.

As a presenter of a GACA-accepted IA training course, you must comply with current guidance to remain valid. Your course is subject to GACA review. If the reviewing GACA Inspector determines your course does not meet the guidelines, you will receive notification.

Your GACA-accepted course number, C-INDUSTRY-MI-070116-K-005-01, will expire on September 30, 2014. Congratulations, and should you have further questions, please contact me at (xx) xxx-xxxx.

Sincerely,

Manager, Airworthiness Division

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### Figure 4.19.2.3. Sample Letter of Renewal

[Date]

[Name]

[Title]

[Address]

Dear Sir:

The General Authority of Civil Aviation (GACA) is pleased to notify you that we have accepted your request for renewal of your 8-hour Inspection Authorization (IA) refresher training titled, “Inspection Authorization Refresher Course”. As of this date, the material submitted meets the requirements of the General Authority of Civil Aviation Regulations (GACAR) § 66.67(a), for IA renewal. Your assigned program identification number will remain C-INDUSTRY-MI-070116 K 005 01. Your course will remain on the GACA’s active list of accepted IA renewal courses for 24 calendar-months unless suspended or removed for cause.

Your course acceptance is effective for a 24 calendar-month period. Before the end of the 24 calendar-month period, you must provide the GACA with a request for course renewal acceptance in accordance with current guidelines. If you do not provide this request at least 60 days before the end of the 24-month period, we will remove your course from the list of acceptable courses.

As a presenter of a GACA-accepted IA training course, we expect you to comply with current guidance in order to remain valid. In addition, your course will be subject to GACA review. If in the reviewing GACA Inspector’s judgment your course does not meet the guidelines, you will receive notification.

Your GACA-accepted course number, C-INDUSTRY0-MI-070116-K-005-01, will expire on September 30, 2014. Congratulations, and should you have further questions, please contact me at (xxx) xxx-xxxx.

Sincerely,

Manager, Airworthiness Division

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### **Figure 4.19.2.4. Sample Letter of Non-Acceptance**

[Date]

[Name]

[Title]

[Address]

Dear Sir:

Regrettably, we reviewed the training course materials you submitted for Inspection Authorization (IA) renewal training titled, “Rewiring the Jetstar EGT System” (2 hours) and found that they did not meet the requirements of General Authority of Civil Aviation Regulations (GACAR) § 66.83(a) and pertinent GACA guidance regarding this matter. Your course content contained over 80 percent of marketing or commercial advertisement of the Supplemental Type Certificate (STC) exhaust gas temperature (EGT) product rather than the in-depth maintenance training we require. In addition, your assigned instructor has no presentation experience. For these reasons, we will not deem your course “acceptable” for IA renewal training.

Thank you for your interest in aviation training. Should you have further questions, contact this office at (xxx) xxx-xxxx.

Sincerely,

Manager, Airworthiness Division

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**Figure 4.19.2.5. Sample Suspended Course Notification**

[Date]

[Name]

[Title]

[Address]

Dear Sir:

This is notification that we removed your Inspection Authorization (IA) refresher training course number, C INDUSTRY-MI-070116-K-005-01, from the accepted listing as of November 11, 2011. We have found that the course does not meet the acceptance criteria and further investigation has proven this correct. Attempts to rectify the situation have been unsuccessful. Attendees since the suspension date will not receive credit for IA renewal under General Authority of Civil Aviation Regulations (GACAR) § 66.83(a). You should notify respective attendees of these actions.

Sincerely,

Manager, Airworthiness Division

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 19. MISCELLANEOUS PARTS 61, 65, 66, 91, 121, 125, 129, 135, 141 AND 145 ADMINISTRATION**

##### **Section 3. Suspected Violations of GACAR § 91.21, Problematic Use of Psychoactive Substances**

**4.19.3.1. GENERAL.** The material in this section is a “quick reference guide” that summarizes the authority of the General Authority of Civil Aviation (GACA) personnel in cases where a GACA employee suspects that a crew member is violating or may violate General Authority of Civil Aviation Regulations (GACAR) § 91.21. This section also contains guidance for the GACA employee to follow in such cases. The guidance in this section applies to any crew member of a civil aircraft, whether employed by an operator conducting commercial operations or as a crew member in general aviation operations.

##### **4.19.3.3. RESPONSIBILITIES AND AUTHORITIES.**

**A. Operator Responsibilities.** An operator and a crew member of an aircraft primarily are responsible for conducting their operations safely and for ensuring compliance with the GACARs. Allegations that a crew member has violated, or may violate, the use of psychoactive substance regulations must be investigated with the highest priority. Prevention of these violations is critical to flight safety.

**B. Authority to Prescribe Rules.** GACAR § 91.21, prohibits any person from acting or attempting to act as a crew member of a civil aircraft while under the influence of any psychoactive substance, by reason of which human performance is impaired. No such person may engage in any kind of problematic used of psychoactive substances. A crew member must comply with the following:

1) Upon request of a law enforcement officer, submit to a test to indicate the presence of any psychoactive substances in the body, when:

a) The law enforcement officer is authorized to conduct the test or to have the test conducted.

b) The law enforcement officer is requesting submission to the test to investigate a suspected violation of the law governing the same or substantially similar conduct

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prohibited by GACAR § 91.21.

- 2) Whenever the GACA has a reasonable basis to believe that a person may have violated the provisions of GACAR § 91.21 in regard to use of psychoactive substances.

**C. Authority to Suspend or Revoke Certificates of Airmen.** Any test information obtained by the President under GACAR § 91.21(c) may be evaluated in determining a person's qualifications for any airman certificate or possible violations, and may be used as evidence by GACA in any legal proceeding under the Civil Aviation Law.

**D. Carriage, Selling and Offering of Psychoactive Substances.** Per GACAR § 91.23:

- 1) GACA has full authority to prohibit any person from operating a civil aircraft within the Kingdom of Saudi Arabia (KSA) if it determines that psychoactive substances or other banned substances are carried in the aircraft.
- 2) This prohibition does not apply when the carriage of the psychoactive or other banned substance is authorized by any government agency.
- 3) No owner or operator of an aircraft registered in the KSA may offer or sell psychoactive substances aboard the aircraft.
- 4) The air operator and the Pilot-in-Command (PIC) must notify passengers entering the KSA that possession of psychoactive substances is illegal unless authorized by a Government agency.

**4.19.3.5. INSPECTOR AUTHORITY.** GACA aviation safety inspectors (Inspectors) are not authorized under GACAR § 91.21 to require a crew member to submit to an alcohol or drug test. They must have a law enforcement officer conduct the test. Any information obtained from the test can be used to determine a person's qualifications for any airman certificate or the results may be used as evidence to substantiate other possible violations.

**A. Objective.** Inspectors must recognize that the fundamental objective of the guidance provided here is to use *all available* GACA resources to prevent any person from acting as crew members while that person is under the influence of any psychoactive substance.

- 1) Accomplishing this often requires ingenuity and quick thinking, especially when time is

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short.

2) Prompt notification of GACA management and the air carrier, using the resources of best communications sources available, usually is the best way to obtain the assistance needed to prevent operation of an aircraft in violation of GACA psychoactive substance abuse regulations.

### **4.19.3.7. INSPECTOR ACTION.**

**A. Receipt of Information.** Any GACA employee who receives information regarding a crew member's operation of an aircraft in violation of psychoactive substance abuse regulations immediately must contact a GACA Inspector and transmit the information to the Inspector.

1) If the Inspector has reasonable cause to believe that a pilot or other crew member is under the influence of psychoactive drugs while performing or attempting to perform his crew member duties, the Inspector shall use the guidance in this section to determine the appropriate action to take.

2) To the extent possible, the Inspector should coordinate with the appropriate GACA management officials before taking action. If the circumstances and time do not permit prior coordination, the Inspector should provide information as soon as possible to the GACA management officials through the appropriate channels on all actions taken to address the situation.

**B. Notification of Operator Officials.** If the crew member is employed by an operator, the Inspector shall promptly contact an appropriate management official of the operator, who is immediately accessible by telephone.

1) The Inspector shall inform the official of the following:

- a) All pertinent information to enable the operator to conduct its own investigation.
- b) The steps that the Inspector intends to pursue based on the information.

2) In providing information to the operator, the Inspector must protect any confidential source who has requested anonymity.

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3) The Inspector shall urge the operator to assist GACA in its investigation and, if appropriate, to take action to ensure that the flight crew member does not serve on the flight.

4) The Inspector should remind the operator official of the provisions of GACAR §§ 91.21 and 91.23 as applicable, and the authority of the GACA to prohibit, where warranted, the operation of the aircraft in the event the carrier fails to take action on its own.

**C. Means of Notification.** The Inspector shall use the most expeditious means available to communicate with GACA personnel and the operator's management personnel.

**D. Scenarios.** Following are some situations an Inspector may encounter. Time is a critical factor in determining intoxication, since alcohol is dissipated from the blood as time passes.

1) An Inspector observes a pilot or crew member who appears to be under the influence of psychoactive substances while performing his duties.

a) The Inspector must request to see the airman's certificate, medical certificate, and other identification.

b) The Inspector shall advise the pilot or crew member not to fly or perform other crew member duties.

c) The Inspector must contact the local law enforcement office and request the presence of a qualified officer who has the authority to conduct the psychoactive substance use test.

d) When the law officer arrives, the Inspector must direct the officer to the suspected pilot or crew member, and provide the crew member's identification.

e) If the pilot or crew member is taken to a hospital for a blood test, the local law officer obtains the test results under local law. The Inspector must then obtain the results from the local law enforcement office.

**E. Legal Process.** Inspectors must make certain all evidence is preserved. It is essential that Inspectors make a record of all conversations with the suspected pilot or crew member. Furthermore, the Inspector must record names and addresses of any witnesses to those conversations or to the suspicious behavior.

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- 1) In non-emergency cases, the pilot or crew member will be notified with the usual compliance enforcement procedures and allowed to respond to charges.
- 2) In emergency cases the pilot or crew member will be advised that the severity of the circumstances endangers life and property and warrants emergency action against his or her airman certificate. The individual should be advised not to exercise the privileges of that certificate. Depending upon the specific incident, the Inspector can ask the pilot or crew member to surrender the certificate to the Inspector voluntarily.

**F. Summary.** It must be emphasized that a law enforcement officer and *not* the Inspector is given the authority to act under the GACAR psychoactive substance abuse rules to conduct tests and gather evidence. The Inspector is authorized to make use of the evidence obtained and to proceed with the violation or certificate action, but it should be reemphasized that a law enforcement officer is necessary to conduct the tests necessary to obtain the evidence.

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#### **CHAPTER 19. MISCELLANEOUS PARTS 61, 65, 66, 91, 121, 125, 129, 135, 141 AND 145 ADMINISTRATION**

##### **Section 4. Evaluate Refueling Procedures and Facilities for Parts 121, 125 and 135**

###### **4.19.4.1 GACA ACTIVITY REPORT (GAR).**

A. 3356 (AW)

**4.19.4.3. OBJECTIVE.** This section provides guidance for evaluating an applicant's refueling procedures and facilities.

###### **4.19.4.5. GENERAL.**

**A. Applicant's Procedures .** An applicant must have procedures for handling and dispensing aircraft fuels per: General Authority of Civil Aviation Regulations (GACAR) Part 121, Appendix G, I(a)(9), § 125.79, and Part 135, Appendix A, I(a)(8). The following must be included as components of the applicant's operations and/or maintenance manuals:

- Dispensing equipment procedures
- Electrostatic protection procedures
- Contamination protection procedures
- Related recordkeeping procedures

**B. Applicant's Manuals .** The applicant's manuals must include procedures for handling and dispensing of aircraft fuels by vendors and contractors. The GACARs do not establish standards for fueling facilities; but this does not relieve the applicant of overall responsibility for conducting those operations within established industry standards.

###### **4.19.4.7. FUELS.**

**A. Aviation Gasoline (AVGAS).** The naming system for the grades of aviation gasoline is

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derived from the general term “AVGAS” followed by the grade marking. The grades are identified by their performance numbers, as recognized by all military and commercial specifications (e.g., 80, 100LL, and 100).

- 1) The naming system for AVGAS grades is printed on all containers in white letters and numbers on a red background.
- 2) Storage containers are also marked with a circular band around the piping, the color of which matches the dye in the AVGAS flowing through the line. The dyes are red for AVGAS 80, blue for AVGAS 100LL, and green for AVGAS 100. A minimum 4-inch wide band is recommended. If the pipeline is painted the color of the AVGAS, then no banding is needed.

**B. Jet Fuels.** The classifications of aviation turbine fuels are universally referred to as “jet fuels.”

- 1) The naming system for the jet fuel is printed on all containers in white letters on a black background to distinguish it from aviation gasoline.
- 2) Examples of jet fuel storage container markings include the following:
  - Jet A fuel containers are marked with a single 4-inch wide (minimum) black band around the piping
  - Jet A 1 fuel containers are marked with two 4-inch wide (minimum) black bands
  - Jet B 1 fuel containers are marked with three 4-inch wide (minimum) yellow bands

**4.19.4.9. REVIEWING THE MANUAL.** Aviation Safety Inspectors (Inspectors) (Airworthiness) must determine whether the applicant’s manual contains appropriate instructions for storage and dispensing of aviation fuels. The instructions must be in accordance with current industry standards, such as Air Transportation Association of America (ATA) Spec 103: Standards for Jet Fuel Quality Control at Aerodromes.

**4.19.4.11. INSPECTING THE FACILITIES.** The General Authority of Civil Aviation (GACA) Inspector is responsible for ensuring that the applicant’s facilities comply with their manual procedures and with established industry standards. For contracted services, it is still the applicant’s responsibility to ensure adherence to its manual procedures and standards.

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**4.19.4.13. COORDINATION REQUIREMENTS.** This task requires coordination with the applicant.

**4.19.4.15. REFERENCES.**

- Federal Aviation Administration (FAA) Advisory Circular (AC) 20-125 (as amended), Water in Aviation Fuels.
- AC 150/523- 4, Aircraft Fuel Storage, Handling, and Dispensing on Aerodromes (as amended).
- ATA Spec 103

**4.19.4.17. PROCEDURES.**

**A. Review the Applicant's Manual .** Ensure that the manual indicates whether services will be performed by the operator or contracted out.

1) Review the applicant's manual to ensure that it defines the following:

- Lines of authority and responsibilities
- The applicant's training program
- The vendor's training program, if applicable

2) Ensure that the manual contains procedures for the following:

- Inspection of incoming fuels
- Elimination of fuel contamination
- Use of dispensing equipment
- Refueling and defueling, by specific make and model of aircraft
- Protection from fire (including electrostatic protection)
- Supervising and protecting passengers during refueling

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3) Ensure that the manual includes procedures for record retention and ongoing inspections of the following:

- Fuel (millipore checks, etc.)
- Storage facilities and dispensing equipment
- Filters
- Safety equipment
- Training programs for servicing personnel
- Individual training records
- Vendors (in accordance with applicant's program)

4) If the manual is acceptable at this point, continue on to the facilities inspection. If the manual is unacceptable, return it to the applicant for corrections and/or revisions.

### **B. Inspect the Facility.**

1) Ensure that:

- Personnel training requirements are documented and current
- Training is conducted according to the manual curriculum
- Piping is marked and color-coded to identify fuel type and grade
- Control/cutoff valves are clearly marked with instructions for emergency use (e.g., on/off)

2) Ensure that the fuel farm/storage area provides for the following:

- Proper security (fenced and posted)
- Proper display of “Flammable” and “No Smoking” signs

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- Markings to identify type/grade of fuel

3) Ensure that the equipment includes the following:

- A positive low point sump
- Adequate fire extinguishers

4) Ensure that fuel filters/filter separators contain, at a minimum, the following:

- An inlet strainer
- Inflow and outflow filter/separators sized to match maximum pump flow capacity
- Differential pressure check system
- Positive water defense system
- Sump drain with outlet located to facilitate capture of outflow
- Fuel sampling (millipore or equivalent) fittings downstream of all filters and filter/separators

5) Ensure that hoses, nozzles, and outflow connectors are:

- Specifically designed and tested for delivery of aviation fuels
- Controlled by spring-loaded, non-bypassable automatic (deadman) fuel flow cutoff valves;
- Equipped with dust cap or other feature that will minimize contaminant introduction into fuel/system
- Equipped with non-bypassable 100 mesh nozzle/connector screens
- Color coded to identify fuel type

6) Ensure that electrical equipment, switches, and wiring are of a type or design approved

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for use in hazardous locations (explosion proof, e.g., free of exposed conductors, contacts, switches, connectors, motors).

7) Verify that grounding and bonding equipment ensures that piping, filters, tanks, and electrical components are electrically bonded together and interconnected to an adequate electrical ground. The system should have ground wires, bonding wires, and clamps adequate to facilitate prompt, definite electrical ground connection between the fueler/pit/cabinet, grounding system, and aircraft being fueled.

8) Ensure that fuel tenders and fueling pits have the following:

- Appropriate markings displayed (e.g., “DANGER,” “FLAMMABLE,” “NO SMOKING,” fuel grade, standard hazardous material placard, filter due dates, and emergency fuel shutoff)
- Appropriately placed fire extinguishers
- Air filter/spark arrestor and a leak-free exhaust system terminating in a standard baffled original equipment type muffler, if equipped with internal combustion engine

**NOTE:** Inspectors are expected to exercise discretion on what facilities need to be inspected at sophisticated international Aerodromes with centralized fueling operations.

**C. Debrief Applicant.** If any deficiencies are noted, discuss possible corrective actions.

### **4.19.4.19. TASK OUTCOMES.**

**A. Complete the GAR.**

**B. Complete the Task.** Successful completion of this task will result in continuation of the certification task in accordance with the appropriate certification process.

**C. Document the Task.** File all supporting paperwork in the applicant’s office file.

### **4.19.4.21. FUTURE ACTIVITIES.** Plan normal surveillance activities.

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#### **CHAPTER 19. MISCELLANEOUS PARTS 61, 65, 66, 91, 121, 125, 129, 135, 141 AND 145 ADMINISTRATION**

##### **Section 5. Evaluate Avionics Test Equipment**

###### **4.19.5.1. GACA ACTIVITY REPORT (GAR).**

A. 3378 (AW) Facilities

B. 3379 (AW) Manuals

**4.19.5.3. OBJECTIVE.** This section provides guidance for evaluating test equipment used during the calibration, repair, and overhaul of avionics equipment.

**4.19.5.5. GENERAL.** A repair facility certificated to maintain airborne avionics equipment must have test equipment suitable to perform that maintenance. Regardless of the type of equipment being used, the minimum test equipment necessary to perform the maintenance, as required by the manufacturer, is acceptable.

**A. Test Equipment Equivalency.** Normally, test equipment equivalent to that recommended by the appliance or aircraft manufacturer will be accepted.

1) Before acceptance, a comparison should be made between the specifications of the test equipment recommended by the manufacturer and those proposed by the repair facility.

2) The test equipment must be capable of performing all normal tests and checking all parameters of the equipment under test. The level of accuracy should be equal to or better than that recommended by the manufacturer.

###### **B. Test Equipment Updating.**

1) State-of-the-art advances often affect the modes and parameters of avionics equipment. Therefore, previously accepted test equipment may need to be modified to ensure compatibility with the new equipment to be tested.

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2) Surplus military test equipment is sometimes used by repair facilities as a primary test unit or as a backup in case of failure of the primary test unit. Modification of this equipment may be necessary to meet current industry standards and equivalency requirements.

**C. Test Equipment Calibration.** The regulations require that maintenance facilities test the test equipment at regular intervals to ensure correct calibration.

1) National Institute of Standards and Technology (or equivalent) traceability can be verified by reviewing test equipment calibration records for references to National Institute of Standards and Technology (or equivalent) test report numbers. These numbers certify traceability of the equipment used in calibration.

2) If the repair station uses a standard for performing calibration, that standard cannot be used to perform maintenance.

3) The calibration intervals for test equipment will vary with the type of equipment, environment, and use. The accepted industry practice for calibration intervals is usually one year. Considerations for acceptance of the intervals include the following:

- Manufacturer's recommendation for the type of equipment
- Repair facility's past calibration history, as applicable

4) If the manufacturer's manual does not describe a test procedure, the repair station must coordinate with the manufacturer to develop the necessary procedures prior to any use of the equipment.

5) Test equipment that is not used to certify items as airworthy (troubleshooting only), should be placarded as such and are excluded from the requirement for periodic calibration traceable to National Institute of Standards and Technology (or equivalent).

**4.19.5.7. AUTOMATIC TEST EQUIPMENT (ATE).** The following guidance should be used to determine the adequacy of maintenance procedures and programs established for the use of ATE. These criteria are intended for the application of ATE to the specific performance evaluation of line replacement units.

A. ATE is a self-contained unit configured and integrated to provide rapid and accurate testing of

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digital and analog avionics equipment. ATE consists of the following:

- Programmable stimulus and measurement devices
- Digital computer hardware and software
- Digital computer peripheral equipment and interface devices
- A means of providing printouts of the test results

**B.** ATE is generally installed at a repair facility as part of the shop test equipment. ATE can vary in size from large units at a repair station, to smaller portable units used in ramp inspections.

- 1) A number of avionics systems used on current aircraft are of such complexity that no manual test equipment has been designed for their testing. Even manufacturers will employ ATE for the testing of production units when no manual test equipment is available.
- 2) If an ATE is to be used on different types of avionics equipment that are similar in function, it must have self-testing features that ensure that the unit is operating within acceptable tolerance limits.

### **4.19.5.9. BUILT-IN TEST EQUIPMENT (BITE).**

**A.** System as a passive fault indicator. If the functional signal flow stops or increases beyond a maximum acceptance level, a visual/aural warning is displayed to indicate that a malfunction has occurred. Warnings are either automatic or generated by the manual selection of switching devices. Some of the functions or capabilities of BITE include the following:

- 1) Evaluations that include:
  - a) Systems status and malfunction verification by:
    - The use of go/no-go alarms
    - Quantitative readouts
  - b) Degraded capabilities status, including:

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- Marginal circuit operation
  - Degree of functional mode deterioration
- 2) Continuous critical monitoring that provides:
- Continuous readout
  - Sampled recorder readout
  - Module and/or subassembly failure isolation

**B.** Prior to acceptance, the aviation safety Inspector (Inspector) (Airworthiness) must determine if the limitations, parameters, and reliability of the testing system are equal to or better than the components and/or systems to be tested. If this cannot be proven, then it's the Inspector's responsibility to require a complete reevaluation of the program.

### **4.19.5.11. PREREQUISITES AND COORDINATION REQUIREMENTS.**

**A. Prerequisites.** None.

**B. Coordination.** This task may require coordination with the avionics manufacturer or GACA Airworthiness Engineers.

### **4.19.5.13. REFERENCES, FORMS, AND JOB AIDS.**

**A. References.**

- General Authority of Civil Aviation Regulation (GACAR) Parts 43, 66, 91, 121, 125, 135, and 145
- Volume 4, Chapter 10, Section 4, Evaluate Repair Station Facilities and Equipment for Part 145

**B. Forms.** GAR.

**C. Job Aids.** None.

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### **4.19.5.15. PROCEDURES.**

#### **A. Perform the Inspection.**

- 1) Determine what test equipment is required, by reviewing the applicant and/or manufacturer's maintenance manuals.
- 2) Determine if the applicant is requesting the use of equivalent test equipment. Prior to the acceptance of equivalent test equipment, accomplish the following:
  - Ensure that the limitations, parameters, and reliability of the proposed test equipment are equivalent to the manufacturer's recommended test equipment
  - Compare the specifications of the manufacturer's and applicant's proposed equipment
  - Observe demonstrations of the proposed test equipment equivalency
- 3) Ensure that the applicant has full control of test equipment (ownership, lease, etc.)
- 4) Ensure that the applicant's manual includes procedures for the following:
  - Identification of the test equipment
  - Inspection and calibration of test equipment
  - Recording of the date and identification of the person accomplishing the calibration
- 5) Inspect all evaluation and test equipment, including precision tools and measuring devices, to ensure the following:
  - That all equipment has been tested at regular intervals and is within its required currency period
  - That test equipment calibration standards are derived from and traceable to one of the following:
    - o The National Institute of Standards and Technology

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- o Standards established by the test equipment manufacturer
- o Other standards acceptable to the President
- o If foreign manufactured test equipment, the standards of the country where it was manufactured

**B. Evaluate ATE/BITE.**

1) Ensure the following:

- a) That the ATE/BITE testing programs provide an in-depth analysis that ensures that the aircraft components are functionally tested within the prescribed manufacturer's limits
- b) That all required checks are accomplished
- c) That the applicant has established procedures that outline and describe the total program and related management control for the ATE unit, to include the following:
  - Limits and standards
  - Performance evaluation checks and tests
  - Identification of individual ATE, by test number
  - Maintenance programs
  - The source of the ATE program tapes, (either in-house programming or approved purchase)
  - The method of controlling and identifying the revision status of software programs

2) Determine if the applicant's purchasing maintenance service ensures that all services are accomplished in accordance with the applicant's approved maintenance program.

3) Ensure that whenever a BITE examination is substituted for a manual check, it performs

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the required qualitative and quantitative tests and analyses to substantiate the component and/or system performance.

4) Ensure that when approving BITE as a substitute for actual manual checks, that the self-check is of sufficient depth to perform the required task.

**NOTE:** Inspectors should not be misled by such statements as “confidence factor” which have no specific meaning unless defined.

5) Ensure that the analysis of BITE includes the limitations and shows whether it checks the component and its associated plugs and wiring.

**NOTE:** Some quantitative BITE may not be capable of checking a total system, such as ILS, unless a signal is introduced into the antenna.

**C. Analyze Results.** Review inspection results and discuss any discrepancies with the applicant.

### 4.19.5.17. TASK OUTCOMES.

**A. Complete and file the GAR.**

**B. Completion of this task may result in the following:**

- Coordination of inspection results with the certification project manager (CPM), if part of a certification project
- Acceptance/approval or non-acceptance/disapproval of the test equipment
- Issuance of a letter to the operator/applicant detailing the results of the inspection

**C. Document Task.** File all supporting paperwork in the operator's office file.

### 4.19.5.19. FUTURE ACTIVITIES.

Normal surveillance.

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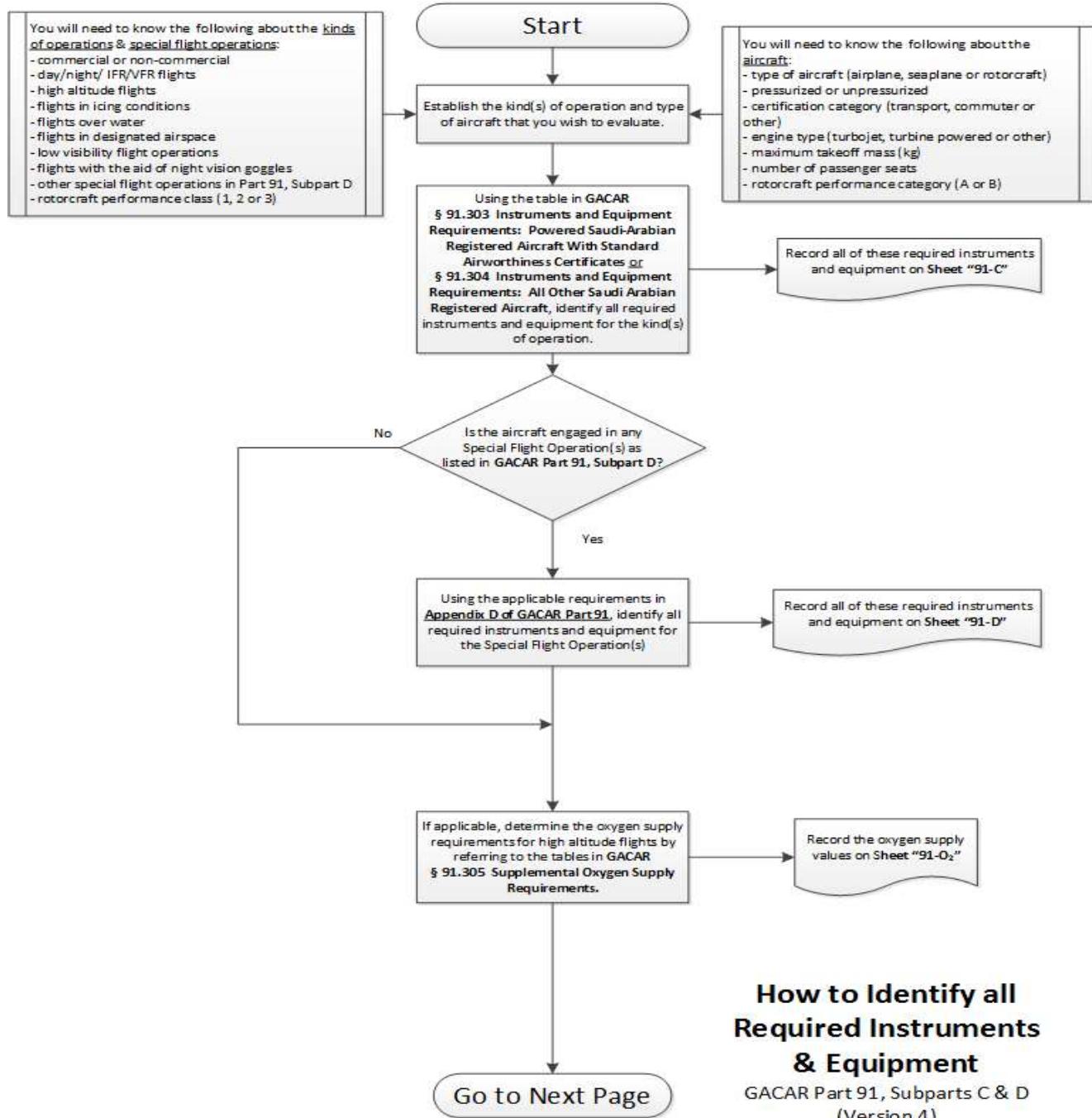
**CHAPTER 19. MISCELLANEOUS PARTS 61, 65, 66, 91, 121, 125, 129, 135, 141 AND  
145 ADMINISTRATION**

**Section 6. How to Determine Required Equipment and Instruments for Aircraft Operating Under  
GACAR Parts 91, 121, 125, 133 and 13**

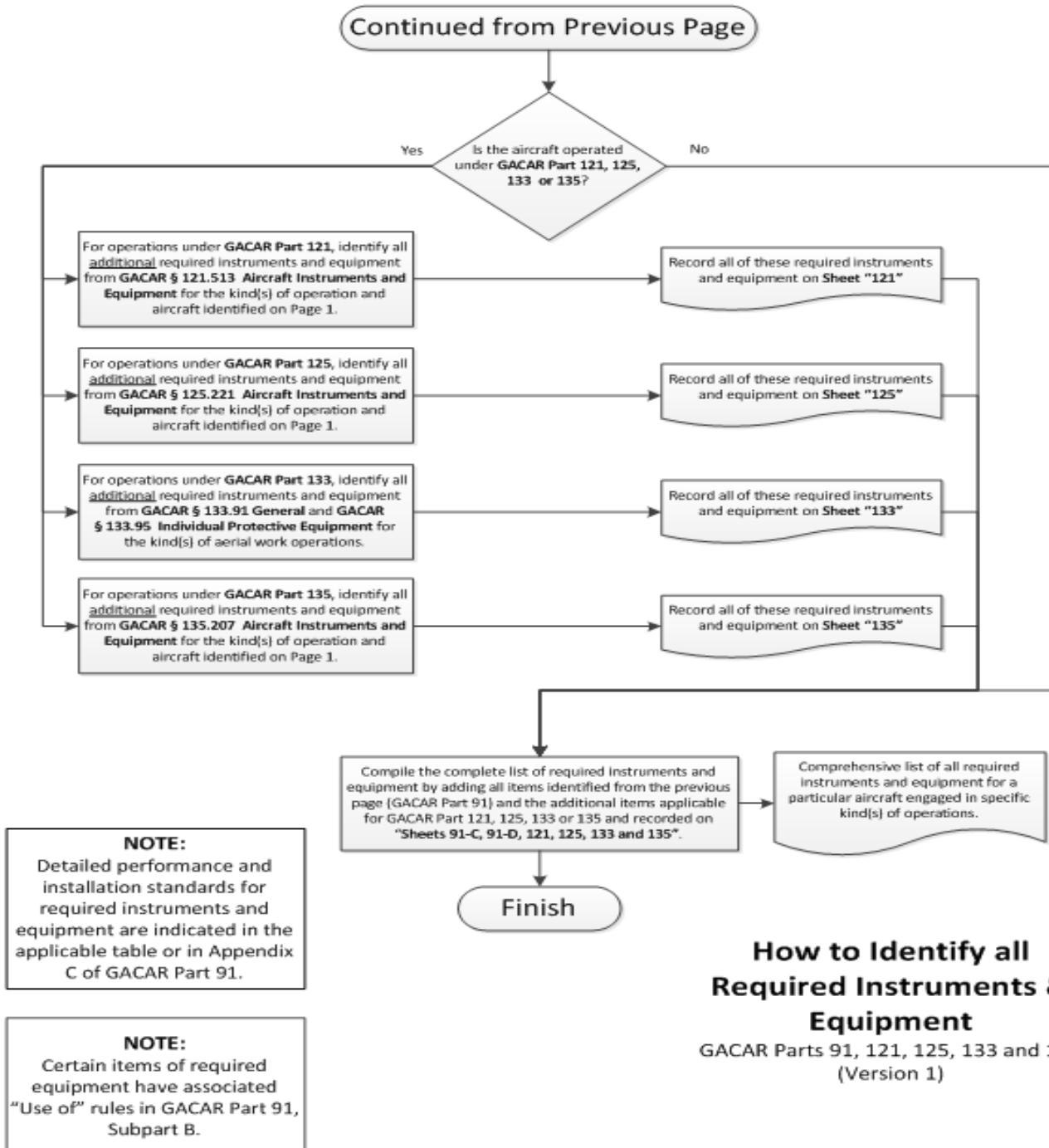
**4.19.6.1. INSPECTOR RESPONSIBILITIES.** The General Authority of Civil Aviation (GACA) aviation safety inspector (Inspector) should use the job-aid provided in this section (Figure 4.19.6.1) when determining if an operator has complied with the applicable aircraft and instrument requirements for the kinds of operation under GACAR Parts 91, 121, 125, 133 and 135.

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**Figure 4.19.6.1. How to Identify All Required Instruments and Equipment**



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**Section 7. Process a One-Time Approval for Maintenance under GACAR § 43.9(i)**

**NOTE:** This guidance to be developed at a later date.

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#### **CHAPTER 20. CHECK PILOT, INSTRUCTOR, AND SUPERVISOR PROGRAMS FOR PARTS 121, 125, 135 AND 142**

##### **Section 1. General**

**4.20.1.1. OBJECTIVE.** Section 1 contains guidance concerning Check Pilots, Air Transportation Instructors, and Air Transportation Supervisors programs for General Authority of Civil Aviation Regulations (GACAR) Part 121 and 135 operators, to include regulatory requirements, qualifications, and functional responsibilities. Section 2 addresses General Authority of Civil Aviation (GACA) approval of Part 121 and 135 Check Pilots. Section 3 addresses Part 125 and Part 142 Check Pilot approval requirements. Section 4 addresses Check Pilot and Air Transportation Flight Instructor training requirements.

**4.20.1.3. REGULATORY REQUIREMENTS.** GACAR § 121.839(a)(5) and 135.377(a)(4) require operators to provide enough flight instructors and check pilots to conduct the flight training and flight checks required in GACAR Part 121 and 135. GACAR § 121.839(d) and 135.377(c) specify that each instructor, supervisor, or check pilot responsible for a particular training curriculum or curriculum segment (including ground and flight training segments and flight checks or competency checks) shall certify the proficiency and knowledge of individuals receiving the training or checks. GACAR §§ 121.863, 121.871, 135.393 and 135.397, as applicable, specify the qualification and training requirements for check pilot and flight instructors. GACAR § 121.891(b) and 121.895(b) require that cabin crew members (CCM) and aircraft dispatchers be given competency checks, which may be given by appropriately qualified air transportation supervisors or ground instructors. GACAR § 121.789(e) requires that CCMs receive Operating Experience (OE) under the supervision of a qualified CCM supervisor.

**4.20.1.5. DEFINITIONS.** For purposes of standardization, the following definitions apply to check pilot, air transportation flight and ground instructors, and air transportation supervisors who train and check under Part 121 and 135 training programs:

**A. Check Pilot.** A check pilot is a pilot who is nominated by his employer and approved by the GACA, who has the appropriate training, experience, and demonstrated ability to evaluate and to certify the knowledge and skills of other airmen. Evaluation is made on the basis of various checks conducted as modules in a specified air carrier's GACA approved training program. A

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check pilot is authorized to conduct proficiency or competency checks (including line checks), to supervise the reestablishment of landing currency, and/or to supervise the initial OE requirements of GACAR §§ 121.789 and 135.343. A check pilot may conduct flight training in the operator's approved program. A check pilot differs from a pilot examiner designated under GACAR Part 183 in that only a pilot examiner may conduct practical tests leading to a pilot certificate issued under GACAR Part 61.

**NOTE:** Part 121 requires that a check pilot reestablish a pilot's landing currency. Part 135 does not have such a requirement.

**B. Air Transportation Flight Instructor.** An air transportation flight instructor is an airman designated by GACAR Part 121 or 135 operators, who has the appropriate training, experience, and demonstrated ability to instruct other airmen in a flight segment (curriculum segment) of that operator's training program. An air transportation flight instructor may certify the proficiency and knowledge of other airmen and recommend them for proficiency or competency checks, proficiency checks leading to certification, and other special qualification flight checks. An air transportation flight instructor may also conduct Line-Oriented Flight Training (LOFT) and Part 121, Appendix D programs when all appropriate requirements have been met.

**NOTE:** An air transportation flight instructor is not required to hold a GACA Flight Instructor Certificate issued under GACAR Part 61 when instructing in GACAR Part 121 or 135 training programs.

**C. Air Transportation Ground Instructor.** An air transportation ground instructor is a person selected and qualified by the operator who has the appropriate knowledge, experience, training, and demonstrated ability to instruct crew members or aircraft dispatchers in curriculum segments other than flight curriculum segments. In accordance with GACAR §§ 121.847(a) and 135.379(a), a ground instructor must be working for and under the direct operational control of the operator, another operator under the same part, or a GACAR Part 142 training center. A ground instructor may certify the satisfactory completion of ground training curriculum segments by flight crew members. A ground instructor who is specifically selected and qualified by the operator may conduct competency checks for CCMs or for aircraft dispatchers, as applicable.

**NOTE:** An air transportation ground instructor is not required to hold a GACA Ground Instructor Certificate issued under GACAR Part 61 when instructing in GACAR Part 121 or 135 training programs.

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**D. Supervisor.** For purposes of this chapter, a supervisor is an aircraft dispatcher or CCM chosen by the operator to conduct competency checks. A CCM supervisor may supervise CCM OE.

**NOTE:** Operators may define the term “supervisor” differently from the definition used in this handbook. Aviation safety inspectors (Inspectors) should ensure that a mutual understanding of the terms used in discussions with their respective operator.

**4.20.1.7. CHECK PILOT ROLE AND CHARACTERISTICS.** The role of the check pilot is to ensure that the flight crew member has met competency standards before the check pilot releases the crew member from training, and to ensure that those standards are maintained while the crew member remains in line service. Effective training and use of check pilot by an operator ensures that flight crew members are standardized in their job performance. A check pilot candidate must be knowledgeable in the applicable requirements of GACAR Parts 61, 65, 91, 121, 135 and other regulations; and further, the candidate must be knowledgeable regarding applicable GACA policies and safe operating procedures required for particular crew member positions. A check pilot candidate must have achieved and maintained a favorable record as a flight crew member. Once approved, a check pilot’s manner and professional reputation should always reflect positively upon the employer and the GACA.

**NOTE:** Under current regulations, no normal term of expiration is specified for approvals of check pilot (unlike designated pilot examiners, whose term is 12 months, per GACAR Part 183). A check pilot’s approval may be given, limited, or withdrawn at the discretion of the Inspector.

**4.20.1.9. CLASSIFICATIONS OF CHECK PILOT.** There are six check pilot classifications, five of which relate to pilots and one of which relates to Flight Engineers (FE). Approval for each check pilot classification is contingent on the check pilot having been properly certificated in the applicable aircraft and crew position, having been trained in accordance with the operator’s approved check pilot training program for the specific classification, and having demonstrated to the GACA the ability to conduct a test event and to evaluate an airman’s performance. The six check pilot classifications are:

- Proficiency Check Pilot - Aircraft (Includes Simulator)
- Proficiency Check Pilot - Simulator (Only)
- Line Check Pilot - All Seats (left, right, observer’s)

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- Line Check Pilot - Observer's Seat Only
- Check Pilot - All Checks
- Check Pilot – Flight Engineer

### **4.20.1.11. PROFICIENCY CHECK PILOT—AIRCRAFT (INCLUDES SIMULATOR)**

**A. Eligibility.** For initial and continuing approval as a proficiency check pilot (aircraft), an airman must meet the following eligibility requirements:

1) Holds the required airman certificates and ratings for the specific aircraft to serve as the pilot in command (PIC) in revenue service.

2) Holds at least a Class 2 medical certificate unless serving as a required crew member, in which case a Class 1 medical certificate is required.

**NOTE:** For programs approved under GACAR § 121.859 (and the sections referenced therein), a medical certificate is not required.

3) Has completed the operator's air transportation flight instructor and check pilot qualification training programs required by GACAR §§ 121.863, 121.871, and Appendix D, or 135.393 and 135.397, as applicable, covering such topics as:

a) Check ride briefings and debriefings:

- For an applicant
- For supporting crew members
- For a safety pilot

b) Safety preparedness and countermeasures:

- In an aircraft
- In a flight simulation training device (FSTD) (such as emergency exits, fire and

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smoke procedures, and motion failures)

4) Meet training and currency requirements to serve as the PIC for that operator, including ground and flight training, proficiency or competency checks, and 90-day landing currency.

5) Maintain line currency as a flight crew member with the operator, or be line familiar with the operator's procedures and line operation by participating in a line observation program that the operator's Inspector has approved.

**NOTE:** The GACA has by policy, elected to make use of certain advisory material published and made available by United States Federal Aviation Administration (FAA). For additional guidance, see FAA Advisory Circular (AC) 120-35 (as amended), Line Operational Simulations: Line Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation.

6) Within the preceding 24 months that person satisfactorily conducts a proficiency or competency check under the observation of a GACA Inspector or a designated examiner employed by the operator. The observation check may be accomplished in part or in full in an aircraft or in a FSTD.

**NOTE:** A check pilot who has reached his 65th birthday or who does not hold an appropriate medical certificate may function as check pilot, but may not serve as a flight crew member in operations under GACAR Part 121 or 135.

**B. Authorized Activities.** A classification of proficiency check pilot (aircraft) authorizes a check pilot to conduct the following activities:

- Pilot proficiency or competency checks conducted as a qualification curriculum segment in the operator's approved training program, from either pilot seat in an aircraft in flight, or in a FSTD, as appropriate
- Flight instruction in the operator's approved training program, from either pilot seat in an aircraft in flight, or in a FSTD, or both, as appropriate
- Supervision of the reestablishment of landing currency
- Special checks conducted as a qualification curriculum segment of the operator's approved

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training program, provided the check pilot is qualified in the specific activity for which the special check is being conducted (such as Category II (CAT II) and Category III (CAT III) operations)

- Certification of the satisfactory proficiency and knowledge of airmen after completion of a flight training curriculum segment or flight training module
- When authorized by the operator, ground instruction for airmen and certification of the satisfactory completion by an airman of a ground training curriculum segment

### **4.20.1.13. PROFICIENCY CHECK PILOT—SIMULATOR (Only.)**

**A. Eligibility.** To be eligible for initial and continuing approval as proficiency check pilot (simulator), an airman must meet the following eligibility requirements:

- 1) Hold the required certificates and ratings (except medical) to serve as the PIC of the specific aircraft in revenue service.
- 2) Have completed the operator's air transportation flight instructor and check pilot qualification training programs as required by GACAR §§ 121.863, 121.871, and Appendix D, or 135.393 and 135.397, as applicable. The requirements of GACAR §§ 121.871(c)(1) and 135.397 (c)(1) may be accomplished entirely in a full flight simulator (FFS), including such topics as:
  - a) Check ride briefings and debriefings:
    - For an applicant
    - For supporting crew members
  - b) Safety preparedness and countermeasures in a FSTD (such as emergency exits, fire and smoke procedures, and motion failures)
- 3) Meet the currency requirements to serve as the PIC for the operator, including ground and flight training and the required proficiency or competency checks. These requirements may be met by using a FFS, in which case landing currency in the actual aircraft is not required.

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4) Maintain line currency as a flight deck crew member with the operator, or be line familiar with the operator's procedures and line operation by participating in a line observation program that the operator's Inspector has approved. A medical certificate appropriate to the crew position occupied on the line is required for those instructors and check pilot who maintain line currency.

5) Initially and at least every two years, satisfactorily demonstrate to an Inspector the ability to conduct proficiency or competency checks in simulated flight in a FSTD. Part of the Inspector's observation must address the check pilot's proficiency in evaluating an airman and operating the FSTD simultaneously.

**NOTE:** A check pilot who has reached his 65th birthday or who does not hold an appropriate medical certificate may function as check pilot, but may not serve as a flight crew member in operations under GACAR Part 121 or 135.

**B. Authorized Activities.** Approval as a proficiency check pilot (Simulator) authorizes a check pilot to conduct the following activities:

- Pilot proficiency or competency checks, as authorized, in an approved FSTD in a qualification curriculum segment of the operator's approved training program.
- The FSTD or aviation training device (ATD), as authorized, of a two-segment proficiency or competency check, as a qualification curriculum segment of the operator's approved training program.

**NOTE:** A two-segment check is one conducted partially in an approved FSTD or ATD and completed in flight in an aircraft.

- Flight instruction in a FSTD as a curriculum segment in the operator's approved training program
- Supervision of the reestablishment of landing currency
- Any special check as a module in the operator's approved training program, provided that the check pilot is qualified in the specific activity for which the special check is being conducted (such as CAT II and CAT III operations)

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- Certification of the satisfactory proficiency and knowledge of airmen after completion of a flight training curriculum segment or flight training module
- When authorized by the operator, ground instruction for airmen and certification of the satisfactory completion of a ground training curriculum segment

### **4.20.1.15. LINE CHECK PILOT—ALL SEATS (LEFT PILOT SEAT, RIGHT PILOT SEAT, AND OBSERVER'S SEAT).**

**A. Eligibility.** For initial and continuing approval as a line check pilot (all seats), an airman must meet the following eligibility requirements:

- 1) Hold the required certificate and ratings for the specific aircraft to serve as the PIC in revenue service.
- 2) Hold a valid medical certificate equal to the class required to act as the PIC in revenue service.
- 3) Meet training and currency requirements to serve as the PIC, including line currency, ground and flight training, proficiency or competency checks, line checks, and 90-day landing currency. (These requirements may be met entirely in a FFS.)
- 4) Have completed the operator's check pilot qualification training program equivalent to that required by GACAR §§ 121.863 and 121.871, or 135.393 and 135.397, as applicable, including such topics as:
  - a) Briefings and debriefings:
    - For the PIC
    - For other crew members
  - b) Safety preparedness and countermeasures:
    - In an aircraft
- 5) Initially and every 24 months, satisfactorily demonstrate to an Inspector the ability to

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conduct line checks from a pilot seat or to oversee OE and other activities.

**NOTE:** A check pilot who has reached his 65th birthday or who does not hold an appropriate medical certificate may function as check pilot, but may not serve as a flight crew member in operations under GACAR Part 121 or 135.

**B. Authorized Activities.** Approval as a line check pilot (all seats) authorizes a check pilot to conduct the following activities:

- Pilot line checks from either pilot seat or the observer's seat
- Supervision of OE from either pilot seat

**NOTE:** OE may be conducted from the observer's seat, in accordance with GACAR § 121.789(c)(ii), provided that the PIC is completing a transition training curriculum by acquiring OE; the PIC has made at least two takeoffs and landings in the aircraft; and the check pilot is satisfied that the pilot is competent to perform as the PIC of that type of aircraft.

- Training and checking in special operations as a module of the operator's approved training program, provided that the check pilot is qualified in the specific operations being conducted (special aerodromes or international routes)
- When authorized by the operator, ground instruction and certification of the satisfactory completion by an airman of a ground training curriculum segment

### 4.20.1.17. LINE CHECK PILOT—OBSERVER'S SEAT ONLY

**A. Eligibility.** For approval as a line check pilot (observer's seat only), an airman must meet the following eligibility requirements:

- 1) Holds the required certificate and ratings to serve as the PIC in the particular aircraft.
- 2) Holds at least a Class 2 medical certificate.
- 3) Meet the currency requirements to serve as the PIC, including ground and flight training, proficiency or competency checks, and 90-day landing currency. These requirements may be

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met entirely in a FFS for this designation.

4) Have completed the operator's check pilot qualification training program equivalent to that required by GACAR §§ 121.863 and 121.871, or 135.393 and 135.397, as applicable, including such topics as:

a) Briefings and debriefings:

- For the PIC
- For other crew members

b) Safety preparedness and countermeasures:

- In an aircraft

5) Initially and at least every 24 months, satisfactorily demonstrate to an Inspector, the ability to conduct line checks from the observer's seat when a second observer's seat is available; otherwise conduct the demonstration in a LOFT session.

6) Maintain line currency as a flight deck crew member with the operator, or be line familiar with the operator's procedures and line operation by participating in a line observation program that has been approved by the operator's Principal Operations Inspector (POI). If the instructor and check pilot want to maintain line currency, then the appropriate medical certificate is required.

**NOTE:** A check pilot who has reached his 65th birthday or who does not hold an appropriate medical certificate may function as check pilot, but may not serve as a flight crew member in operations under GACAR Part 121 or 135.

**NOTE:** The operator must have procedures published in his operations manual which he will follow in the event that a line check pilot determines that a pilot's performance does not meet standards that would allow the individual to continue to operate the aircraft. The check pilot must not allow the crew member to continue the flight or trip. If the line check pilot does not possess the appropriate class of medical certificate to substitute for the crew member, specific alternative procedures must be followed.

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**B. Authorized Activities.** Approval as a line check pilot (observer's seat only) authorizes a check pilot to conduct the following activities as modules of the operator's approved training program, provided that the PIC and second-in-command (SIC) are current and fully qualified in the aircraft:

- Line checks from the observer's seat
- Training and checking for special operations, from the observer's seat, provided that the check pilot is qualified in the specific operation (such as special aerodromes and international routes)
- When authorized by the operator, ground instruction and certification of the satisfactory completion by an airman of a ground training curriculum segment

**4.20.1.19. CHECK PILOT—ALL CHECKS**The airman must meet eligibility requirements for a proficiency check pilot (aircraft), for a proficiency check pilot (simulator), and for a line check pilot (all seats), in accordance with earlier paragraphs in this section. Approval as a check pilot (all checks) authorizes a check pilot to conduct all checks contained in the qualification curriculum segment of the operator's approved training program, including those checks and other activities of a line check pilot (all seats). With the approval of the operator, a check pilot has the authorization to give flight and ground instruction in that training program.

**4.20.1.21. CHECK PILOT - FLIGHT ENGINEER (FE).** Approval as a check pilot FE is appropriate for operators using aircraft exclusively for their FE training programs. This approval is also appropriate for operators using FSTDs for part or all of those training programs.

**A. Eligibility.** For initial and continuing approval as a check FE, an airman must meet the following eligibility requirements:

- 1) Hold the required certificate and class ratings to serve as a FE on the specific aircraft in revenue service.
- 2) Hold a valid Class 2 medical certificate when conducting aircraft training or checks in an aircraft in flight.
- 3) Have completed the operator's approved air transportation check pilot training program for this function, including the training required by GACAR §§ 121.863 and 121.871, as

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applicable to the FE crew position, including topics such as:

a) Check ride briefings and debriefings:

- For an applicant
- For supporting crew members

b) Safety preparedness and countermeasures:

- In an aircraft (if applicable)
- In a FSTD (such as emergency exits, fire and smoke procedures, and motion failures)

4) Meet the training and currency requirements to serve as a FE for the operator in the specific aircraft, including ground training, flight training, and proficiency checks.

5) Maintain line currency as a flight deck crew member with the operator, or be line familiar with the operator's procedures and line operation by participating in a line observation program that the operator's Inspector has approved.

6) Initially and at least every 24 months, satisfactorily demonstrate to an Inspector, the ability to conduct a FE proficiency check in a FSTD.

**NOTE:** When the normal procedures portion of the check must be conducted in an aircraft and in flight, an Inspector must observe the check pilot candidate under those conditions. If the normal procedures segment of the check can be conducted in a FSTD, the check pilot may be evaluated either in the FSTD or in an aircraft.

**B. Authorized Activities.** Approval as a "Check Pilot - Flight Engineer" makes a check pilot eligible to conduct any or all of the following activities, subject to the specific terms (authorizations and limitations) shown in the letter of approval:

- FE proficiency checks in an approved FSTD or in an aircraft, as a module of the qualification curriculum segment in the operator's approved training program

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- Instruction of FEs in an approved FSTD or in an aircraft, as a module in the operator's approved training program
- Certification of the satisfactory performance of airmen after completion of a flight training curriculum segment or flight training module
- When authorized by the operator, ground instruction and certification of the satisfactory completion by an airman of a ground training curriculum segment

**4.20.1.23. AIR TRANSPORTATION INSTRUCTOR ROLE AND CHARACTERISTICS.** An air transportation instructor is a person employed by an operator or training center for the purpose of training flight crew members in a Part 121 or 135 operators' approved ground training curriculum. The training must be sufficient to ensure that acceptable performance standards are met. When selected and qualified by the operator, an air transportation instructor is responsible for certifying the knowledge and proficiency of each crew member upon completion of a training curriculum or curriculum segment. Air transportation instructors must be knowledgeable in the applicable requirements of Parts 61, 65, 91, 121, 135 (as appropriate), and in the operator's policies and procedures. An air transportation instructor should possess effective communication skills and a manner which always reflects professionalism and a positive attitude toward safety.

**4.20.1.25. AIR TRANSPORTATION FLIGHT INSTRUCTOR—AIRCRAFT** An air transportation flight instructor in an aircraft may be a pilot instructor, a FE instructor, or both, and may also conduct flight training in a FSTD, ATD or ground training.

**A. Eligibility.** An instructor candidate airman must meet the following eligibility requirements:

- 1) Hold the certificate and ratings required to serve in revenue service in the specified crew member duty position on the specific aircraft except that the certificates and ratings are not required for training programs approved under GACAR § 121.859(b) (simulators).
- 2) Holds at least a Class 2 medical certificate unless serving as a required crew member, in which case holds a Class 1 medical certificate, as applicable.
- 3) Meet currency requirements to serve as the PIC for the operator or as FE for the operator, including ground and flight training, proficiency or competency checks, and (for pilots) 90-day landing currency.

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- 4) For pilots, must complete an annual line check or line observation module of a recurrent qualification curriculum segment.
- 5) Have received flight instructor qualification training under the operator's approved training program, including the training required by GACAR §§ 121.867, 121.875, and Appendix D, or 135.395 and 135.399, as applicable.
- 6) Maintain line currency as a flight deck crew member with the operator, or be line familiar with the operator's procedures and line operation by participating in a line observation program that the operator's Inspector has approved. For those instructors and check pilot who maintain line currency, holding a medical certificate appropriate to the crew position occupied on the line is a requirement.

**B. Authorized Activities.** An air transportation flight instructor in an aircraft, when authorized by the employer, may conduct the following flight instruction activities:

- Flight instruction for airmen in an aircraft in flight, including instruction in giving appropriate preflight and postflight briefings
- Certification of the satisfactory performance of an airman after completion of a flight training curriculum segment or flight training module
- When authorized by the operator, ground instruction and certification of the satisfactory completion by an airman of a ground training curriculum segment

### **4.20.1.27. AIR TRANSPORTATION FLIGHT INSTRUCTOR—SIMULATOR**An air transportation flight instructor in a FSTD, and may be a pilot instructor, a FE instructor, or both.

**A. Eligibility.** A candidate must meet the following eligibility requirements:

- 1) Under a Part 121 training program, a pilot simulator instructor candidate must hold at least an Airline Transport Pilot certificate (ATP); and additionally, a type rating when conducting initial training.
- 2) Under a Part 135 training program, a pilot simulator instructor candidate must hold an ATP and the appropriate type rating. A commercial certificate with an instrument rating is sufficient when operations of the aircraft do not require the PIC to hold an ATP and type

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rating.

3) Pilot simulator instructor candidates must have received the training required by Part 121, Appendix D, when applicable. All candidates must have received the simulator instructor qualification required by the operator's approved training program including that required by GACAR §§ 121.867, 121.875, and Appendix D, or 135.395 and 135.399, as applicable, including such topics as:

- a) Briefings and debriefings by the PIC to flight deck crew members and to other crew members.
- b) Safety preparedness and countermeasures in a FSTD (such as emergency exits, fire and smoke procedures, and motion failures).

**NOTE:** The requirements of GACAR §§ 121.875 and 135.399 may be accomplished entirely in a FSTD.

4) Maintain line currency as a flight deck crew member with the operator, or be line familiar with the operator's procedures and line operation by participating in a line observation program that the operator's Inspector has approved. A medical certificate appropriate to the crew position occupied on the line is required for those instructors and check pilot who maintain line currency.

**B. Authorized Activities.** An air transportation flight instructor in a FSTD, when authorized by the employer, may conduct the following flight instruction activities:

- Flight instruction of airmen in a FSTD, including instruction in giving the appropriate preflight and postflight briefings
- Certification of the performance of an airman after completion of the FSTD portion of a flight training curriculum segment or flight training module (GACAR § 121.859(b))
- When authorized by the employer, ground instruction and certification of the satisfactory completion by an airman of a ground training curriculum segment

### **4.20.1.29. AIR TRANSPORTATION GROUND INSTRUCTOR.**

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**A. Eligibility.** GACAR § 121.847(a) and 135.379(a) specify that other than the operator, only another operator under the same rule part or a Part 142 training center may provide training or checking under contract. In addition, GACAR §§ 121.839(a)(2) and 135.377(a)(2) require that operators provide adequate ground training facilities and properly qualified ground instructors. An Inspector should monitor an operator's ground instruction to ensure that only qualified and competent instructors teach the approved training curriculum and curriculum segments. Inspectors and check pilot conducting checking events must evaluate the knowledge and competency of crew members that have completed the ground training curriculums. They should identify any deficiencies and effect any required corrections with respect to the trainee, the instructor, or the training program itself. Inspectors should monitor instructor training records to ensure that air transportation ground instructors are properly qualified.

**B. Authorized Activities.** An air transportation ground instructor, when selected and qualified by the operator, may instruct in specified ground training curriculum segments.

**NOTE:** The use of any training device, including mockups and ATDs is appropriate provided that the use of such a device is an integral part of an approved ground training curriculum segment (no flight training credit permitted).

**C. Training and Qualification Records.** The operator must maintain documentation of the training and qualification for each air transportation ground instructor and supervisor, and must make that documentation conveniently accessible for inspection by the GACA.

**4.20.1.31. PART 121, CCM AND AIRCRAFT DISPATCHER SUPERVISORS.** An air carrier operating under GACAR Part 121 engaged in passenger-carrying operations must establish and maintain a program to train and qualify CCM supervisors. Scheduled operators must also establish and maintain a program to train and qualify aircraft dispatcher supervisors. Those supervisors have the authorization to conduct the competency checks required by GACAR Part 121 for CCMs and aircraft dispatchers respectively. GACAR §121.839(d) specifies that ground instructors and supervisors responsible for a particular ground training curriculum segment or competency check must certify the proficiency and knowledge of CCM crew members and aircraft dispatchers after completion of the competency check. When these ground instructors are chosen by their employers to conduct competency checks for aircraft dispatchers or CCMs, they are termed air transportation supervisors, as defined in this handbook. To qualify, these supervisors must complete the appropriate training curriculum and the required competency check. To maintain qualification, supervisors must complete the required recurrent training curriculum. Inspectors should monitor training records to

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ensure that air transportation supervisors who conduct CCM competency or aircraft dispatcher competency checks are properly qualified.

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#### **CHAPTER 20. CHECK PILOT, INSTRUCTOR, AND SUPERVISOR PROGRAMS FOR PARTS 121, 125, 135 AND 142**

##### **Section 2. Check Pilot Approval**

**4.20.2.1. OBJECTIVE.** This section provides guidance on the process for approval of a check pilot and procedures to ensure that the approved airman meets certain specified criteria.

##### **4.20.2.3. GACA ACTIVITY REPORT (GAR).**

- A. 1346 (OP) (Pilot)
- B. 1347 (OP) (Flight Engineer)
- C. 1349 (OP) (Oceanic Navigation)

##### **4.20.2.5. GENERAL.**

A. This section addresses procedures for approval of a check pilot. All check pilots must be approved by an operator's Principal Operations Inspector (POI). Approval is based on an airman:

- Having the proper certificates and ratings
- Being qualified in accordance with the operator's approved initial, transition, or upgrade training program
- Having completed the operator's approved check pilot training program for the appropriate check pilot functions
- Having demonstrated the ability to conduct flight checks and to evaluate the performance of airmen to the satisfaction of a General Authority of Civil Aviation (GACA) aviation safety inspector (Inspector)

B. The check pilot approval process follows the five phases described below.

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**NOTE:** Use Figure 4.20.2.4, Check Pilot Approval Job Aid, as a guide when completing the five phases below.

### **4.20.2.7. PHASE ONE—OPERATOR FAMILIARIZATION WITH CHECK PILOT REQUIREMENTS AND LETTER OF REQUEST.**

**A. Beginning the Approval Process.** The first phase of the check pilot approval process involves a discussion between the operator and the Inspector. The Inspector should ensure that the operator understands the regulatory check pilot training requirements and that a check pilot candidate must satisfactorily demonstrate the ability to perform check pilot functions to an Inspector before approval. The Inspector should also ensure that the operator is prepared to submit the necessary documentation to initiate the approval process, which is as follows:

**B. Required Information.** The letter of request constitutes the operator's nomination. It originates from the operator, not a training center, check pilot candidate, or some other party. As a minimum, it includes:

- The airman's full name
- Applicable airman's certificate number
- Current crew member position
- Requested check pilot classification
- Aircraft type
- Brief résumé of the airman's aviation background and experience
- Copies of the airman's appropriate airman certificates
- Copy of the airman's medical certificate, as applicable
- Copies of the airman's training records, including his initial, transition, or upgrade training in requested aircraft type; record of most recent applicable recurrent training; and record of check pilot training

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**NOTE:** An Inspector may require that this information be expanded to suit circumstances.

**4.20.2.9. PHASE TWO—SUBMISSION OF DOCUMENTATION** Phase Two begins when the operator submits the documentation listed in paragraph 4.20.2.7 to the Inspector for evaluation. The operator may transmit this submission by conventional mail, e-mail, fax, or by other means mutually acceptable to the operator and the Inspector. The Inspector will initially review the information to determine if the check pilot candidate meets the basic qualification requirements for the type of check pilot approval sought. (Refer to Section 1 above)

**A. Unacceptable Submission.** If the operator's submission is unacceptable, the Inspector should return the submitted documentation with a statement of the reason for non-acceptance.

**B. Acceptable Submission.** If the operator's submission is acceptable, the Inspector should initiate Phase Three.

### 4.20.2.11. PHASE THREE—REVIEW OF DOCUMENTATION

**A. Verification.** The Inspector will verify the check pilot candidate's certificates and background. The Inspector will then create an office file for the individual.

**NOTE:** Creation of the office file at this point in the process will allow for documentation of subsequent action regarding the individual without having the records rejected.

**B. Training Requirements.** Before the Inspector can evaluate an airman for approval as a check pilot, all required training must be completed. The airman's training records must show satisfactory completion of initial, transition, or upgrade training and all training required under the operator's approved check pilot training program for the specified classification. The approved training program must contain all training required by General Authority of Civil Aviation Regulations (GACAR) §§ 121.863 and 121.871, or 135.393 and 135.397 that is applicable to the approval being sought. When the airman's records show that the airman has previously completed a required curriculum segment, the segment does not have to be repeated.

**C. Non-Qualification.** If, after reviewing the documentation, the Inspector determines that the candidate does not qualify as a check pilot, the Inspector will provide the operator with a statement of the reason for non-acceptance.

### 4.20.2.13. PHASE FOUR—CHECK PILOT EVALUATION

In order to evaluate a check pilot

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candidate effectively, Inspectors must become thoroughly familiar with the operator's procedures. Inspectors must also become familiar with any special regulatory requirements affecting the operator, such as special conditions contained in the operations specifications and exemptions.

**A. Choosing Airmen as Subjects.** The Inspector conducting an evaluation for an original check pilot approval must observe the check pilot candidate conduct an actual check. The purpose of the check pilot evaluation is to ensure that the candidate has achieved the required skills for briefing, evaluating, and debriefing an airman. The airman receiving the check should be a line crew member who is due for an evaluation. The airman will not be an instructor or check pilot unless previous approval has been received from the Inspector. Such approval is reserved for unusual circumstances.

**B. Check pilot Candidate's Flying Skills .** Except for an initial cadre approval, a check pilot evaluation does not entail an evaluation of the candidate's flying skills in a crew position. An operator should not request approval of an individual as a check pilot when there is any question about the airman's flying skills in a crew position. Should the Inspector have reason to question a candidate's proficiency, the check pilot evaluation will not be conducted until the candidate's proficiency is verified. An acceptable way to verify the airman's proficiency is to conduct a check the check pilot candidate. An Inspector may conduct a proficiency check, a competency check, or a line check of the check pilot candidate, scheduled at some time before the official check pilot evaluation. Such checks are not routinely required.

**C. Satisfactory Evaluation.** If the Inspector determines that a check pilot candidate meets criteria for the requested check pilot approval, the Inspector will inform the candidate that a recommendation of approval will be reported to the overseeing Inspector. In this case, the check pilot candidate will certify the proficiency of the airman receiving the check and complete the necessary recordkeeping tasks. The Inspector may permit the new check pilot to be scheduled immediately as a check pilot even though processing of the letter of approval has not been completed, provided that a GAR entry has been completed to document the satisfactory check pilot evaluation.

**D. Unsatisfactory Evaluation.** If the Inspector determines a candidate does not qualify for the requested check pilot approval, the Inspector will inform the candidate that approval will not be granted. In such a case, the Inspector must determine whether the airman receiving the check performed satisfactorily, and must certify the airman's proficiency and complete the necessary records.

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**NOTE:** The failure of a check pilot candidate is uncommon and usually ends a candidate's eligibility for check pilot status. In rare circumstances, the Inspector may allow a re-evaluation. In such a case, the operator must conduct sufficient additional training, recertify the candidate's proficiency, and arrange to have another evaluation conducted by an Inspector.

**E. Content of Check pilot Evaluation.** The following guidance applies to an Inspector's evaluation in respect to each of the six classifications of check pilot.

- 1) *Proficiency Check Pilot—Aircraft and Simulator* An Inspector must evaluate this candidate while the candidate conducts a proficiency check or competency check in an aircraft in flight. The Inspector should observe the candidate conducting the entire check in the aircraft. The candidate should be evaluated on his ability to evaluate an individual while, at the same time, performing the crew member activities normally associated with the seat the check pilot candidate occupies. The Inspector may observe part of the check in the aircraft and the remainder in a flight simulation training device (FSTD).
- 2) *Proficiency Check Pilot—Simulator Only* An Inspector must evaluate this candidate while the candidate conducts the FSTD segment of an actual proficiency check, or competency check, as applicable. The candidate should be evaluated on his ability to evaluate an individual while, at the same time, demonstrating proficiency in operating the FSTD. Time management and the ability to adapt to events that might disrupt a planned sequence of events should be considered. If the entire proficiency check or competency check can be accomplished in a FSTD, the candidate must be observed conducting the entire check.
- 3) *Line Check Pilot—All Seats* An Inspector will evaluate this candidate while the candidate conducts an actual line check from either pilot seat. Satisfactory performance will also permit the candidate to conduct a line check from the forward observer's seat, during line-oriented flight training, during revenue service, or during nonrevenue service. A candidate for line check pilot-all seats must be qualified to be a pilot-in-command (PIC) for that operator and hold a Class 1 medical certificate.

**NOTE:** The operator must have procedures published in their operations manual that will be followed in the event that a line check pilot determines that a pilot's performance does not meet standards that would allow the individual to continue to operate the aircraft. The

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crew member will not be allowed to continue the flight series or trip. If the line check pilot does not possess the appropriate class of medical certificate to substitute for the crew member, specific alternative procedures must be followed.

4) *Line Check Pilot—Observer's Seat Only* An Inspector must evaluate this candidate while he conducts an actual line check from the forward observer's seat during revenue or during ferry service. When the evaluation is conducted during revenue service in an aircraft with only one observer's seat, a candidate who holds a Class 2 medical certificate who has not yet reached 65 years of age and is otherwise qualified for Part 121 operations, may be evaluated while conducting a line check from the right pilot seat. In this case, the PIC must be fully qualified and line current. A check pilot who is approved to conduct line checks from the observer's seat and who does not maintain line currency must be observed by an Inspector at least once every 24 calendar months. If an evaluation within this time period is not given, the check pilot is not authorized to conduct line checks.

**NOTE:** The operator must have procedures published in their operations manual that will be followed in the event that a line check pilot determines that a pilot's performance does not meet standards that would allow the individual to continue to operate the aircraft. The crew member must not be allowed to continue the flight series or trip. If the line check pilot is not qualified (including appropriate medical certificate) to substitute for the crew member, specific alternative procedures must be followed.

5) *Check Pilot—All Checks* An Inspector must evaluate this candidate in accordance with preceding the paragraphs. The evaluations for this approval may be treated cumulatively.

**NOTE:** An airman may have been designated as “proficiency check pilot-aircraft” for a number of years and then qualify as a line check pilot-all seats. If the operator does not use FSTDs in the training program, then upon satisfactory completion of the line check evaluation, the check pilot could be approved to conduct all of the forgoing checks.

6) *Check Pilot - FE*. An Inspector must evaluate this candidate while the candidate conducts an FE proficiency check in a FSTD. In normal, abnormal, and emergency procedures, segments of the check are normally accomplished in a FSTD. In those instances when a check FE candidate is to conduct any portion of a check in an airplane in flight, the check pilot candidate must be a qualified and current FE and must be evaluated during an actual flight.

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### F. Conducting a Check Pilot Evaluation.

1) *Pre-evaluation Briefing.* An Inspector conducting a check pilot evaluation must arrange to meet with the candidate in sufficient time for a pre-evaluation briefing. The Inspector must explain the purpose of the evaluation and some ground rules, including: (1) the check should be conducted as if the candidate were fully qualified in the role of check pilot; (2) during the briefing, the Inspector may ask questions of the check pilot candidate as part of the evaluation; and (3) the Inspector will not ask questions while the check is in progress.

2) *Observing and Debriefing the Candidate.* While the check is in progress, the Inspector will observe, but should not interrupt or otherwise interfere with the check pilot candidate's management of the check. The Inspector must determine that all required events and maneuvers were conducted properly; that the check pilot candidate's evaluation of the airman's performance was objective and accurate; and that the check pilot candidate's debriefing of the airman was thorough and constructive.

#### 4.20.2.15. PHASE FIVE—CHECK PILOT APPROVAL

All check pilot approved for GACAR Part 121 or Part 135 operations must be approved by the operator's POI.

**A. Letter of Approval.** Approval of a check pilot will be in the form of a letter of approval addressed to a responsible official of the operator and be signed by the Inspector, or a representative approved by the Inspector. This letter of approval may be transmitted to the operator by conventional mail, e-mail, by fax, or by other means acceptable to the operator and the Inspector. The Inspector should retain a copy of the check pilot letter of approval together with the operator's original letter of nomination for the candidate. The check pilot letter of approval must contain the following:

- Identification of the air operator for which the approval is granted
- Check pilot's name and applicable GACA airman's certificate number
- Approved check pilot classification
- Specified category, class, or type of aircraft
- Authorizations and limitations

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- Effective date of each approval (since different approvals may occur at different times, this information simplifies record checks. The date on which the check pilot was recommended for approval by an Inspector will be the effective date of approval.) See Figures 4.20.2.1 through 4.20.2.3 for sample letters of approval

**NOTE:** Under current regulations, no normal term of expiration is specified for approvals of check pilot. A check pilot's approval, however, may be given, limited, or withdrawn, at the discretion of the POI.

**B. Limitations.** A check pilot will be approved only in the six classifications listed in this section.

### C. Letter of Approval—Other Copies

- 1) The original of the check pilot letter of approval will be sent to the operator for which the check pilot has been approved.
- 2) A copy of the letter of approval will be retained in check pilot's office file together with the operator's original letter of request for the check pilot candidate. This copy will be maintained until 2 years after the approval is withdrawn or superseded.

**D. GAR.** The Inspector must ensure that a record of the approval is entered in the GAR. A future GAR entry will also be required when check pilot approval is withdrawn or terminated. In addition, a copy of the following information needs to be kept in the office file on the operator:

- 1) The current number of active check pilot approved for the operator.
- 2) The correct status of the individual.

**4.20.2.17. APPROVAL OF INITIAL CADRE CHECK PILOT.** During the early phases of establishing a check pilot program, initial cadre check pilot are required. Initial check pilot candidates must first become fully qualified as flight crew members and then be trained, evaluated, and approved as a check pilot. Because the regulatory language of GACAR Part 121 and 135 does not address a training process for initial cadre check pilot, this handbook provides guidance. The process that follows is valuable for startup operations for at least two reasons:

- It is a practical way to initiate and build a check pilot program

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- It takes advantage of proving flights, when the operator/applicant is under close GACA scrutiny, with desirable effects on the check pilot program

**A. Letter of Request from Operator.** The overseeing Inspector must arrange with the operator/applicant to approve one or more likely check pilot candidates to form an initial cadre of temporary check pilot. The operator/applicant will submit a letter of request, as described earlier in this section. This letter comprises the request for initial cadre check pilot and a description of the training that they will undergo.

**B. Letter of Approval.** The Inspector must approve the candidates using procedures described earlier in this section. Usually initial cadre check pilot are approved to function as check pilot—all checks or check FE, so that they may conduct all types of checks and supervise Operating Experience (OE) during the period that the startup operation is beginning. The initial cadre check pilot, letter of approval is a temporary approval, to be replaced with a permanent letter of approval after the check pilot is fully qualified. The initial cadre check pilot letter must contain a statement similar to the following:

(Name) is approved as an initial cadre check pilot to function as a check pilot-all checks or as a check FE for the purpose of initiating operations with the (type of aircraft) for (name or operator). This approval expires on (expiration date).

### 4.20.2.19. TRAINING, CERTIFICATION, AND QUALIFICATION—STARTUP

The operator must provide a full qualification process for its initial cadre check pilot.

**A. Initial Training and Certification.** The operator must first arrange to have initial cadre check pilot trained and appropriately certificated for their cockpit duty positions. The operator may provide the training by contracting with a manufacturer, with another operator of the same GACAR operating part, or with properly qualified individuals. An Inspector or an aircrew program designee (APD) may certificate the initial cadre airmen, provided that the examiner is employed by an air operator operating under GACAR Part 121 or 135.

**B. Gaining Proficiency as Instructors.** After the initial training and certification, initial cadre check pilot must become proficient in the operator's proposed training program by instructing each other, or in the case of a single initial cadre check pilot, by self-training. During this training, an operator may arrange for a pilot from the manufacturer, from another operator, or from another source to act as the safety pilot or instructor pilot.

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**C. Proficiency and Competency Checks.** After the first initial cadre check pilot have become proficient as instructors, they may then begin the training and checking of other initial cadre check pilot in accordance with the operator's initially approved flight training and qualification curriculum segments. Each check must be observed by an Inspector who holds the appropriate airman's certificate, and the appropriate type rating, when applicable. If the Inspector determines that the performance of an initial cadre check pilot conducting a certain check is satisfactory, the Inspector will recommend to the overseeing Inspector that the airman be approved as a check pilot for that type of check. One initial cadre check pilot may check another, with the process repeated until each candidate has been approved as a check pilot or has been terminated from the program. If only one person is being considered to be the initial cadre check pilot, an Inspector will observe that person conducting a check of another airman. If the candidate's performance is satisfactory, the Inspector must recommend to the overseeing Inspector that the candidate be removed from temporary status and approved for full-time check pilot duty with the operator.

### **D. Operating Experience (OE).**

1) Initial cadre check pilots will be permitted to acquire OE flight hours on any flight that can be credited toward the proving-test flight-hour requirement (including training flights, ferry flights, and representative en route proving flights). OE flight hours may be accrued by initial cadre check pilot while they are:

- Conducting aircraft checks
- Overseeing the OE of other airmen
- Being checked
- Acquiring OE under the supervision of another initial cadre check pilot

2) Initial cadre check pilots must receive a line check and conduct a line check during an en route proving flight or a ferry flight. The same process (above) will apply: one initial cadre check pilot line checks another while being observed by an Inspector. If the airman's performance is satisfactory, the Inspector may recommend that the person be removed from temporary status and approved for full-time duty as a check pilot for the operator. If there is only one initial cadre check pilot, then the Inspector will conduct the line check.

#### **4.20.2.21. APPROVAL OF A CHECK PILOT IN MULTIPLE AIRCRAFT.** Before an airman may be

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approved as a check pilot in more than one type of aircraft, the operator must show that there is a need. The airman must be fully qualified and current in each of the aircraft types. Overseeing Inspectors must be judicious in approving check pilot and vigilant in overseeing their performance. There are a variety of acceptable combinations of check pilot approvals.

- A. A check pilot may be approved to serve in all airplanes that an operator operates under Part 135.
- B. A check pilot may be approved to serve in two different types of rotorcraft.
- C. For Part 135 operations, a check pilot may be approved to serve in a combination of two of the following aircraft families:
  - One series of multiengine airplanes
  - Single-engine airplanes
  - Rotorcraft
- D. Before a candidate may be approved as a check pilot in two commuter category aircraft types or two transport category types, the overseeing Inspectors must ensure that the following conditions are met:
  - For proficiency check pilot-aircraft or simulator, the candidate must have logged at least 500 hours as PIC in each type
  - For line check pilot, the candidate must have logged at least 100 hours as PIC in each type and at least 1,000 hours as PIC in transport or commuter-category airplanes
  - For check FE, the candidate must have logged at least 500 hours as a FE in each type

**4.20.2.23. APPROVAL OF A CHECK PILOT FOR MULTIPLE OPERATORS.** This paragraph provides a standard method for approving a check pilot to serve multiple operators. The approval of a check pilot to serve more than one operator is limited to those cases in which the operator's aircraft, aircraft operating manuals, procedures, and checklists are compatible in the judgment of the overseeing Inspector(s). Provision for multiple check pilot approvals may be made for Part 135 single-pilot operators and for Part 121 and Part 135 operators with programs that are compatible in

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the judgment of the respective operator's POI. An operator's POI may also approve a check pilot to serve multiple Part 121 or Part 135 operators on a temporary basis when a startup operation is initiated or when new equipment is being introduced. See Figure 4.20.2.3 for a sample letter.

**4.20.2.25. CREW MEMBER FAILURE RATES.** The repetitive failure of a single crew member, or the failure of several crew members during proficiency or competency checks, may indicate a training program deficiency. Overseeing Inspectors must establish procedures with their operators that provide for GACA notification when unsatisfactory performance occurs. Identified deficiencies should be promptly investigated and corrective action taken. A comparison of failure rates between checks conducted by Inspectors and those conducted by check pilot should also be made. If a significant difference in failure rates exists, additional observations and counseling should be conducted. The overseeing Inspector must discuss the matter with the appropriate official responsible for the operator's training and checking activities. Should these discussions not lead to an improvement in the quality of training and evaluations, consideration should be given to withdrawing approval of any check pilot involved, or if appropriate, withdrawing approval for a specific part or for the entire training program.

### **4.20.2.27. FUTURE ACTIVITIES.**

**A. Periodic Report by the Operator.** The Inspector should arrange to have the operator provide them with a periodic report of each check pilot's checking activities, including a pass/fail rate, to coincide with the Inspector's periodic review. Inspectors may arrange for these reports to arrive at a time that meets the Inspector's needs. A check pilot should be active enough to retain the required knowledge and skills. This activity level may vary depending on the check pilot function, the size of the operator, and the number of approved check pilot. Usually a check pilot should conduct at least eight authorized check pilot activities during a 12-month period (including supervision of OE). The Inspector should specifically re-assess the operator's need for those check pilot whose records indicate low activity levels.

**B. Withdrawing Check Pilot Approval.** The Inspector's reasons for withdrawing the approval of a check pilot may include a lack of check pilot activity, a request by the operator, or an unsatisfactory performance on the part of the check pilot. To withdraw approval of a check pilot, the Inspector must notify the operator by letter that approval is withdrawn. The letter should include the name of the check pilot, the effective date of withdrawal, and the reason approval is being withdrawn. If the approval of a check pilot is withdrawn because of unsatisfactory performance, the letter of withdrawal must be sent to the operator.

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**NOTE:** Since no normal term of expiration is specified for approval of check pilots, contract check pilots who are employees of a Part 142 training center will have their term contingent upon continued employment with the training center and maintaining their instructor or evaluator qualification with the employing center.

**C. Inspector Authority.** A check pilot's approval may be given, limited, withdrawn, or terminated at the discretion of the POI.

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**Figure 4.20.2.1. Check Pilot Letter of Approval—Sample A**

[Date]

[Name of Chief Pilot]

[Address]

Dear Sir:

[Check pilot name];, GACA certificate number 123456789, is approved as a check pilot. This check pilot is approved to conduct checks in the Douglas DC-9 aircraft for employees of [XX Airlines]. This approval is applicable for the following checking functions:

- |   |                             |
|---|-----------------------------|
| <input type="checkbox"/> Proficiency Check pilot—Aircraft                 | Effective _____             |
| <input checked="" type="checkbox"/> Proficiency Check pilot—Simulator     | Effective <u>09/24/2013</u> |
| <input type="checkbox"/> Line Check pilot—All Seats                       | Effective _____             |
| <input checked="" type="checkbox"/> Line Check pilot—Observer's Seat Only | Effective <u>09/24/2013</u> |
| <input type="checkbox"/> Check pilot—All Checks                           | Effective _____             |
| <input type="checkbox"/> Check pilot - Flight Engineer                    | Effective _____             |

Please retain a copy of this letter in Mr. [Check pilot name]:individual flight training records.

Sincerely,

Director, Flight Operations Division  
GACA-S&ER

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**Figure 4.20.2.2. Check Pilot Letter of Approval—Sample B**

[Date]

[Name of Chief Pilot]

[Address]

Dear Sir:

[Check pilot name]: GACA certificate number 4123456789, is approved as a check pilot. Mr. [Name] is approved to conduct checks in multiengine Cessna, reciprocating-series airplanes and in all single-engine airplanes to pilots that are employed by [XX Airlines]. This approval is applicable for the following checking functions:

- |  |                             |
|--|-----------------------------|
| <input type="checkbox"/> Proficiency Check pilot—Aircraft      | Effective _____             |
| <input type="checkbox"/> Proficiency Check pilot—Simulator     | Effective _____             |
| <input type="checkbox"/> Line Check pilot—All Seats            | Effective _____             |
| <input type="checkbox"/> Line Check pilot—Observer's Seat Only | Effective _____             |
| <input checked="" type="checkbox"/> Check pilot—All Checks     | Effective <u>09/24/2013</u> |

Please retain a copy of this letter in Mr. [Check pilot name]: individual flight training records.

Sincerely,

Director, Flight Operations Division  
GACA-S&ER

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**Figure 4.20.2.3. Check Pilot Letter of Approval for Multiple Operators**

[Date]

[Name of Chief Pilot]

[Address]

Dear Sir:

[Check pilot name]: GACA certificate number 123456789, is approved as a check pilot. Mr. [Name]: is approved to conduct checks in multiengine Cessna, reciprocating series airplanes and all single engine airplanes to pilots that are employed by:

[XX Airlines], Effective 02/24/2013, and [YY Airlines], Effective 03/15/2013.

This approval is applicable for the following designated functions:

[X] Proficiency Check pilot—Aircraft	Effective <u>09/24/2013</u>
[ ] Proficiency Check pilot—Simulator	Effective _____
[X] Line Check pilot—All Seats	Effective <u>09/24/2013</u>
[ ] Line Check pilot—Observer's Seat Only	Effective _____
[X] Check pilot—All Checks	Effective <u>09/24/2013</u>

Please retain a copy of this letter in Mr. [Check pilot name]: individual flight training records.

Sincerely,

Director, Flight Operations Division  
GACA-S&ER

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**Figure 4.20.2.4. Check Pilot Approval Job Aid**

<b>1.</b>	Operator's Letter Contains Necessary Information:
<input type="checkbox"/>	Full name of candidate
<input type="checkbox"/>	Crew position and aircraft type
<input type="checkbox"/>	Type of check pilot designation requested
<b>2.</b>	Certificates (copies)
<input type="checkbox"/>	Applicable airman
<input type="checkbox"/>	Medical
<input type="checkbox"/>	Any valid check pilot Letters of Approval
<b>3.</b>	Training Records (copies)
<input type="checkbox"/>	Initial, transition, or upgrade to requested aircraft and crew position
<input type="checkbox"/>	Recurrent
<input type="checkbox"/>	Check pilot
<b>4.</b>	<input type="checkbox"/> Resume of experience included
<b>5.</b>	<input type="checkbox"/> Check pilot evaluation scheduled
<b>6.</b>	<input type="checkbox"/> Report of evaluation received from GAR
Favorable Report:	
<b>7.</b>	Prepare Letter of Approval
<input type="checkbox"/>	Original letter to operator
<input type="checkbox"/>	Copy to supervisor
<input type="checkbox"/>	Copy to operator file
<input type="checkbox"/>	Copy to other Inspector (if check pilot for another operator)
<b>8.</b>	<input type="checkbox"/> Complete GAR
<input type="checkbox"/>	Complete office file
Unfavorable Report:	
<b>9.</b>	<input type="checkbox"/> Prepare letter to operator indicating disapproval
<b>10.</b>	<input type="checkbox"/> Complete GAR
<b>11.</b>	<input type="checkbox"/> Complete office file

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#### **CHAPTER 20. CHECK PILOT, INSTRUCTOR, AND SUPERVISOR PROGRAMS FOR PARTS 121, 125, 135 AND 142**

##### **Section 3. Approve a Check Pilot for Part 125 Operations and a Part 142 Check Pilot for Training Center Checks**

###### **4.20.3.1. GACA ACTIVITY REPORT (GAR).**

- A. 1346 (Pilot)
- B. 1347 (Flight Engineer)
- C. 1349 (Oceanic Navigation)

**4.20.3.3. OBJECTIVE.** This task determines if an applicant is eligible for check pilot authority under General Authority of Civil Aviation Regulation (GACAR) Part 125 or 142. Successful completion of this task results in the issuance of a letter of authority (LOA) giving an individual check pilot authority or results in denial of check pilot authority.

###### **4.20.3.5. GENERAL.**

**A. Authorization.** A check pilot authorization may be issued to an individual assigned check pilot duties to conduct initial, recurrent, and instrument checks required by GACAR §§ 125.337(b), 125.347, 125.349, and 125.353 or 142.61, as applicable.

**B. Letter of Request.** Requests for approval of a check pilot (including check pilot for Flight Engineers (FE), if necessary) should be submitted in letter form (Figure 4.20.3.1) by the operator to the General Authority of Civil Aviation (GACA). Each request received by the GACA will be reviewed by an aviation safety inspector (Inspector) to determine the need for a check pilot, based on factors such as the complexity of the operation (number of aircraft and flight personnel) and the qualifications of the nominee, before scheduling any tests.

**C. Instruction.** Inspectors will instruct the check pilot in the proper conduct of practical tests and in the completion and disposition of an airman applicant's file.

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**4.20.3.7. ASSESSING CHECK PILOT QUALIFICATIONS.** When evaluating the qualifications of a check pilot nominee, the Inspector has to determine the nominee's currency.

**A. Other Proficiency Checks.** The Inspector may accept proficiency checks conducted under GACAR § 121.797 to establish qualifications for the check pilot nominee. Furthermore, the successful completion of a proficiency check under either GACAR Part 121 or Part 125 satisfies the requirements of GACAR § 61.17.

**B. Conditions for Accepting Part 121 Proficiency Checks.** A pilot proficiency check conducted in accordance with Appendix C of GACAR Part 121 may be accepted as meeting the requirements for operations conducted under GACAR Part 125 if:

- 1) The check is conducted in the same type of aircraft or in a flight simulation training device (FSTD) approved under GACAR § 121.855 for each flight maneuver or procedure to be accomplished during the proficiency check.
- 2) The pilot has passed a written or oral test on the appropriate provisions of GACAR Parts 61, 91, and 125, and the contents of the operations specifications (OpSpec) and manual of the operator (GACAR § 125.349(a)).
- 3) A properly documented record of that crew member is maintained in accordance with the requirements of GACAR §§ 125.531, 125.543 or 142.91(b), as applicable.

**4.20.3.9. CONDUCT OF THE EVALUATION FLIGHT.** The Inspector is responsible for the authorization/denial of check pilot. The Inspector may perform all of the procedures or may assign a qualified Inspector to conduct the practical test.

**A. Inspector Responsibility During the Test.** The evaluation flight of a check pilot nominee is considered to be a practical test of the nominee's ability to test other airmen. However, since the nominee is not yet authorized as a check pilot, the Inspector is actually conducting a dual test on both the check pilot nominee and on the airman being tested. This situation should be discussed and explained to all participants before the flight and it should be made clear as to who is the PIC during the evaluation. It is similar to the situation where an Inspector observes a pilot examiner nominee conducting a practical test.

**B. Simulated Emergencies.** Before beginning a flight test in an aircraft, discuss with the nominee the method in which simulated emergencies will be created and agree on the method to

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be used to preclude an actual emergency. If an actual emergency occurs, the test must be terminated immediately and attention focused on crew coordination and operation of the aircraft to the extent necessary to handle the situation.

**C. Postflight Critique.** After the flight evaluation, the Inspector and the check pilot nominee must confer before advising the airman being tested of the results of the test. This is a continuation of the evaluation of the check pilot nominee. The check pilot nominee indicates whether the other airman's performance was satisfactory or unsatisfactory and the justification for the decision. The Inspector indicates agreement or disagreement and why, then decides whether to pass or fail the check pilot nominee and the airman being tested. The procedures for handling the various pass/fail situations are in paragraph 4.20.3.19 below.

### **4.20.3.11. APPROVAL OF PART 142 TRAINING CENTER PERSONNEL AS CONTRACT CHECK PILOT.**

**A. Inspector Approval.** Inspectors are authorized to approve Part 142 Training Center Evaluators (TCE) as contract check pilot to conduct initial, recurrent, and/or instrument proficiency checks required by GACAR §§ 125.337(b), 125.347, 125.349 and/or 125.353.

#### **B. Contract Check Pilot Requirements.**

- The subject training center or satellite, and aircraft make, model, and series (M/M/S) must specifically be listed in the operator's OpSpecs A31
- The operator must have made a formal written request to the GACA, nominating the subject individual as a contract check pilot
- The nomination letter must include the documentation required to enable the Inspector to evaluate each candidate as required in Section 2 above
- The nominated individual must have completed the operator's required check pilot training for all areas and subjects in which the operator requests check pilot authority
- An Inspector must observe the nominated individual initially and at least once each subsequent 24 calendar-months performing a checking function using either the subject operator's procedures or those of another operator under the same GACAR part

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- TCEs without certification authority or a Part 142 contract instructor may be granted authorization to conduct check pilot activities (i.e., proficiency/competency checks) that do not result in GACA certification

**NOTE:** See Section 2, Figure 4.20.2.4, Check Pilot Approval Job Aid.

**C. Approve More Than One Contract Check Pilot.** At the discretion of the POI, the Inspector may approve more than one contract check pilot in a single LOA. List each individual's name, certificate number, and associated authorizations and limitations in the LOA. A subsequent change to one individual's status will require the LOA to be reissued to reflect the revision.

**D. Training Center Principal Inspector's (PI) Role .** Experience has shown that the PI is usually in the best position to make quality assessments at training centers on behalf of the GACA. The PI continually assesses training programs conducted by a training center for certification of airmen under GACAR Part 61. Similarly, the PI assesses the instructors and TCEs employed by a training center. At the request, and with the concurrence of an operator's POI, a training center's PI may assist with the evaluation of an operator's request to use the services of a training center's employee as a contract check pilot.

**E. Scheduling Multiple-Use Check pilot.** The overseeing Inspector must ensure that the operators understand that the scheduling and use of the check pilot is their responsibility before a multiple approval is made. An operator entering into a multiple-use arrangement may employ a check pilot on a part-time basis, may contract with another operator or training center to provide a check pilot, or may contract directly with the check pilot. However, each operator must ensure that the check pilot maintains currency as specified in the appropriate operating rule in Section 1 above and performs adequately when serving the operator.

**F. Contract Check pilot for Multiple Operators.** An operator seeking check pilot approval for an individual already serving as a check pilot for another operator must provide the same information to their POI as described above. The operator's POI must consider the means the operator will use to train, to qualify, and to maintain qualification of the contract check pilot candidate and the required documentation. Contract check pilot can meet recurrent training requirements for more than one operator simultaneously. When the operator and their POI have agreed on the training and qualification necessary for the contract check pilot, the operator must submit a written letter of request to the POI, as described earlier in this chapter.

**G. Contract Check Pilot LOAs.** When approved as a contract check pilot for an operator, the

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POI of that operator will issue a letter of authority showing the operator, the check pilot classification, the type(s) of aircraft authorized, and the type(s) of checks authorized (by regulatory reference).

**H. Recordkeeping.** Each operator is required by their operating rules to maintain training and qualification records for its check pilots. This responsibility cannot be delegated. However, by agreement between the operator and the training center, a training center may keep a contract check pilot's training and qualification records. This agreement must be documented in each operator's recordkeeping system and approved by the Inspector. The Inspector must maintain a record in the operator's file that documents the details of any such arrangement, including the location in the operator's manual where such arrangement is described.

### **4.20.3.13. PREREQUISITES AND COORDINATION REQUIREMENTS FOR OTHER THAN PART 142 TRAINING CENTER CONTRACT CHECK PILOT.**

**A. Prerequisites.** This task requires knowledge of regulatory requirements in Part 125, GACA policies and, specifically,

- Check pilot authorization process
- Task background

**B. Coordination.** This task requires coordination between the Inspector, the POI, the training center PI, the Director and if applicable an Inspector (Airworthiness).

### **4.20.3.15. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References:**

- GACAR Part 1, 61, and 91
- Volume 9, Chapter 2, Certification of Pilots and Flight Instructors Under Part 61
- Volume 14, Designees – Appointment & Management

#### **B. Forms:**

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- GACA Activity Report (GAR)

### C. Job Aids:

- Sample letters

#### 4.20.3.17. PROCEDURES.

**A. Letter of Request.** Review the applicant's letter of request for check pilot authorization to determine if there is a need for a check pilot. Base your decision on the following:

- Number of airplanes and flight crew members
- Complexity of operations
- The nominee's qualifications

- 1) If you determine that the company does not need a check pilot, issue a letter of denial (see Figure 4.20.3.2).
- 2) If you determine there is a need for a check pilot, review the nominee's qualifications.

**B. Nominee's Qualifications .** Ensure that the nominee meets the following applicable requirements. The nominee must provide the appropriate information and meet and maintain the following qualifications. The following information should be included with the letter of request.

1) For a pilot check pilot:

- An airman certificate with category, class, ratings, and type ratings appropriate for the airplane in which tests will take place
- A medical certificate appropriate for the category of airman certificate
- The pilot in command (PIC) requirements of GACAR § 125.281
- The recency of experience requirements of GACAR § 125.343

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- The initial and recurrent pilot testing requirements of GACAR § 125.349
  - The PIC requirements of GACAR § 125.353 for instrument flight rules (IFR) flight
- 2) The ability to evaluate another pilot's technique and proficiency properly. This can be determined by a history as a check pilot for another operator, as a certificated flight instructor, as a pilot examiner, etc.
- Qualifications, knowledge, and experience which commands respect and confidence
  - Good record as a pilot and good reputation in the industry and the local aviation community for honesty and dependability
- 3) For a FE check pilot:
- An airman certificate with category, class, ratings, and type ratings appropriate for the airplane in which tests will take place
  - A medical certificate appropriate for the category of airman certificate
  - Meet the experience requirements of GACAR § 125.337
  - The recency of experience requirements of GACAR § 125.347
  - The initial and recurrent pilot testing requirements of GACAR § 125.349
- 4) If the nominee does not meet the above qualifications, issue a letter of denial to the company (see Figure 4.20.3.3).
- 5) If the nominee is qualified, schedule the evaluation flight.

**C. Schedule the Evaluation Flight.** Determine the date, time, and place of the evaluation flight based on Inspector availability and workload.

**D. Before the Evaluation Flight.** Before conducting the actual evaluation flight, determine that the nominee is knowledgeable on the following:

- Parts 61, 91, and 125
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- Appropriate practical test standards (PTS)
- OpSpecs/LOAs
- Relevant portions of the policies and procedures manual
- Techniques associated with administering a particular practical test
- The procedures and limitations for performing normal, abnormal, and emergency maneuvers
- The appropriate action to be taken when acceptable standards have not been met
- How to fill out the applicable GACA forms
  - 1) If the nominee does not show adequate knowledge of the above, then issue a letter of denial (see Figure 4.20.3.3).
  - 2) If the nominee has adequate knowledge of the above, conduct the evaluation flight.

**E. Observe Oral Portion of Test.** Observe the nominee conducting the oral portion of a test or check of a company airman.

**F. Evaluate Oral Portion of Test.** Evaluate the nominee's conduct of the oral portion of the test or check. Consider the following items when evaluating the nominee's oral test.

- 1) Did the oral test include the items listed in GACAR § 125.349(a)?
- 2) Did the nominee properly evaluate the results of the pilot's oral examination?

**G. Oral Portion of Test Unsuccessfully Administered.** If the nominee did not successfully administer the oral portion of the test or check:

- 1) Advise the nominee of the failure.
- 2) Recommend that nominee be denied check pilot authority by entering results onto the GAR.

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- 3) Route the GAR (as applicable).
- 4) Recommend that the overseeing Inspector issue a letter of denial to company (see Figure 4.20.3.3).

**H. Oral Portion of Test Successfully Administered.** If the nominee successfully administered the oral examination, continue with the flight portion of the evaluation.

**I. Observe Flight Portion of Test.** Observe the nominee conduct a required test or check and the postflight debriefing.

**J. Evaluate Flight Portion of Test.** Consider the following items when evaluating the nominee's conduct of the flight test and the debriefing.

1) For a pilot check pilot nominee:

- Did the flight test include a competency check of the maneuvers and procedures currently required for the issuance of a commercial pilot certificate with instrument rating as required by GACAR §§ 141, Appendix C? (Refer to GACAR § 125.349(b))
- Was the flight test conducted in an efficient and logical sequence?
- Was the flight test conducted safely?
- Did the debriefing reflect the actual performance of the pilot?
- Did the nominee properly evaluate the results of the pilot's flight test?

2) For a FE check pilot nominee:

- Did the flight test satisfactorily cover the items required by GACAR § 143, Appendix A?
- Was the flight test conducted in an efficient and logical sequence?
- Was the flight test conducted safely?
- Did the debriefing reflect the actual performance of the FE?

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- Did the nominee properly evaluate the results of the FE's flight test?

### **K. Flight Portion of the Test Unsuccessfully Administered.**

1) If the check pilot nominee did not successfully administer the flight test, but the airman being checked performed the required maneuvers and procedures successfully, then:

- Advise the check pilot nominee of the failure
- Advise the airman being checked the test is successful
- Recommend that the check pilot nominee be denied check pilot authority by entering recommendation onto the GAR data sheet. List specific reasons for the denial in the recommendation
- Route the GAR data sheet to the overseeing Inspector
- Recommend that the overseeing Inspector issue a letter of denial to company (see Figure 4.20.3.3).

2) If both the nominee and the airman being tested performed unsuccessfully, advise both of the failures and follow the steps above.

### **L. Flight Test Administered Successfully.**

1) If the nominee successfully administered the flight test and the airman being tested successfully performed all required maneuvers and procedures, then:

- Advise the check pilot nominee of the results
- Advise the airman being tested of the results
- Recommend that the check pilot nominee be approved for check pilot authority by entering recommendation onto the GAR data sheet
- Route the GAR data sheet to the overseeing Inspector

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- Recommend that the POI issue a LOA to the company (see Figure 4.20.3.4)
- 2) If the nominee successfully administered the test but the airman being tested did not successfully perform all the required maneuvers and procedures, then:

- a) Advise the check pilot nominee of the successful results and follow the steps above.
- b) Advise the airman being tested of the failure.
- c) Recommend that the check pilot nominee be approved for check pilot authority by entering recommendation onto the GAR data sheet.

**4.20.3.19. TASK OUTCOMES.** Completion of this task results in one of the following:

- Issuance of a LOA for check pilot privileges
- Issuance of a letter of denial to the company
- Complete the GAR

### **4.20.3.21. FUTURE ACTIVITIES.**

**A.** Withdraw the check pilot authorization and request the return of the letter authorizing the check pilot when:

- There is no longer a need for check pilot services
- The check pilot's performance is not satisfactory
- The check pilot leaves the employment of the operator issued the check pilot authorization (see Figure 4.20.3.5)
- Possible compliance investigation if the check pilot's performance is not satisfactory
- Possible re-evaluation of the check pilot, or pilots the check pilot has tested under GACAR Part 125

**B.** Follow-up surveillance of the operator and check pilot.

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### **Figure 4.20.3.1. Sample Letter from Operator Requesting Check Pilot Approval**

Dear Sir:

Valley Air, Inc. is requesting check pilot authorization for one of its employees, Mr. [insert name]. Mr. [insert name], if authorized, will give initial, recurrent, and instrument checks required by General Authority of Civil Aviation Regulations (GACAR) §§ 125.349 and 125.353. Valley Air, Inc. operates one B-737 aircraft with two alternating crews of three.

Mr. [insert name] is holder of Airline Transport Pilot Certificate number 123456789 and has a current Class 1 medical certificate. Furthermore, Mr. [insert name] meets the pilot in command (PIC) instrument proficiency check requirements of GACAR § 125.353. Before being employed by Valley Air, Inc., Mr. [insert name] was a highly regarded flight instructor and pilot examiner locally. He has no history of accidents, incidents, or violations and is considered by the local aviation community to be a competent and safe pilot.

Attached are photocopies of Mr. [insert name] airman and medical certificates, his most recent logbook entries, and a current resume. He is available at your convenience for an evaluation.

Yours truly,

Director of Operations

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**Figure 4.20.3.2. Letter Denying Check Pilot Request-Company Need**

[GACA LETTERHEAD]

Dear Mr. [insert name]:

This is in response to your recent letter requesting check pilot authorization for Mr. [insert name], an employee of Valley Air, Inc.

After an initial review of Mr. [insert name] record, we have determined that he meets all the necessary qualifications. However, we feel that the size of Valley Air's operation (two flight crews) does not warrant a check pilot position. The necessary initial, recurrent, and instrument checks can continue to be performed as they have been, by Inspectors from this office or the air carrier under contract that provides your training.

Sincerely,

Manager, Flight Operations Division

GACA SS&AT

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**Figure 4.20.3.3. Letter Denying Check Pilot**

[GACA LETTERHEAD]

Dear Mr. [insert name]:

During the flight check conducted to determine Mr. [insert name] qualifications for check pilot authorization, Mr. [insert name] failed to demonstrate the necessary knowledge and skill for conducting instrument proficiency checks. [For any reason, state specifics.] Therefore, Valley Air's request for a check pilot authorization for Mr. [insert name] is denied.

Contact this office at [telephone number] if you have any questions.

Sincerely,

Manager, Flight Operations Division

GACA SS&AT

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**Figure 4.20.3.4. Sample Letter – Authorization of Check Pilot**

April 10, 2012

[GACA LETTERHEAD]

Dear Mr. [insert name]:

Mr. [insert name], holder of Commercial Pilot Certificate No. 123456789, is approved as check pilot for Doro Aviation Service. He is authorized to conduct 6-month instrument checks, initial, and recurrent (oral, written, and flight) checks for pilots to be used by Doro Aviation Service. This authorization is limited to the conduct of checks in the Douglas DC-9 aircraft/simulator.

Unless sooner recalled, this letter becomes invalid if Mr. [insert name] employment with Doro Aviation Service terminates. In that event, this letter must be returned to this office. Please place a copy of this letter in Mr. [insert name] individual record.

Sincerely,

Manager, Flight Operations Division

GACA SS&AT

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**Figure 4.20.3.5. Letter Withdrawing Check Pilot**

[GACA LETTERHEAD]

Dear Mr. [insert name]:

A review of your personnel files during a recent visit to Doro Aviation Service revealed that Mr. [insert name] is no longer employed by your company. Therefore, please be advised that the letter of authority (LOA) issued to Doro Aviation Service for Mr. [insert name] to act as a check pilot is rescinded.

The LOA must be returned to this office as soon as possible.

Sincerely,

Manager, Flight Operations Division

GACA SS&AT

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 20. CHECK PILOT, INSTRUCTOR, AND SUPERVISOR PROGRAMS FOR PARTS 121, 125, 135 AND 142**

##### **Section 4. Training for Check Pilots and Air Transportation Flight Instructors**

**4.20.4.1. OBJECTIVE.** This section provides guidance concerning the training requirements for check pilot and air transportation flight instructors.

**4.20.4.3. NOMINATION.** The operator selects instructors and submits the selections for review by the General Authority of Civil Aviation (GACA). The operator nominates a check pilot and submits its nominees for approval by its principal operations inspector (POI). Because the experience levels of pilots and flight engineers vary among operators, it is impractical to specify minimum experience levels for candidates. In some cases, such as those involving new operators, candidates may have relatively little flight experience. Regardless of experience levels, candidates must demonstrate high levels of knowledge and skill in the applicable job functions. Inspectors must ensure that adequate training for check pilot and air transportation flight instructors has been completed and that the training has been documented in the applicable training records.

**4.20.4.5. TRAINING FOR FLIGHT INSTRUCTORS AND CHECK PILOT.** To ensure that their flight instructors or check pilots are adequately trained, each operator's approved initial flight instructor training program and initial check pilot training program includes the training specified in General Authority of Civil Aviation Regulation (GACAR) §§ 121.863, 121.871 and Appendix D; or 135.393 and 135.397, as applicable. Check pilot and air transportation flight instructor candidates must satisfactorily complete the operator's approved initial transition, or upgrade training programs for the desired aircraft and duty position. In addition, instructors must complete the operator's instructor training, and check pilot must complete the operator's instructor and check pilot training. If a flight instructor or check pilot has satisfactorily completed curriculum segments in previous transition training that applies to more than one duty position or aircraft, it is not necessary to repeat those segments.

##### **A. Ground Training.**

- 1) Ground training for air transportation pilot flight instructors (including flight instructors using simulators), pilot proficiency check pilot (including check pilot using

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simulators), and line check pilot must include the following topics:

- Fundamental principles of the teaching–learning process
- Teaching methods and procedures
- Instructor–student relationships

2) GACAR 121.871(c) and § 135.397(c) provide that the aforementioned topics need not be included when the candidate holds a flight instructor certificate issued by the GACA. These regulations do not relieve the operator of the responsibility for ensuring that instructors and check pilot remain proficient in these areas:

- a) Regulatory and administrative functions of instructors and check pilot, as appropriate.
- b) Applicable regulations.
- c) The operator’s policies and procedures.
- d) Methods, procedures, and techniques for conducting required checks.
- e) Seat-dependent tasks for the specific aircraft.
- f) Analysis of airman performance, including identification of improper or insufficient training.
- g) Crew resource management (CRM) concepts and vocabulary.
- h) Appropriate corrective actions for unsatisfactory performance during training or evaluation.
- i) Guidelines and safety measures for emergency situations likely to develop in conducting the required normal, abnormal, and emergency procedures in an aircraft and in a flight simulation training device (FSTD), as appropriate.
- j) The consequences of improper or untimely safety measures.

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**B. Flight Training – Air Transportation Flight Instructors and Check Pilots.** Flight training for air transportation flight instructors and proficiency check pilot—aircraft—simulators and line check pilot must include the following:

- 1) Enough flight training and practice in conducting training (and flight checks for check pilot) from the left and right pilot seats using the required normal, abnormal, and emergency procedures to ensure the individual's competency in conducting the required flight training (and pilot flight checks if applicable). For an air transportation flight instructor—aircraft and a proficiency check pilot—aircraft, training, and practice in the takeoff and landing events of the operator's approved training program must be conducted in an aircraft; the remainder of the training may be conducted in a FSTD. For an air transportation flight instructor—simulator only and a proficiency check pilot—simulator only, this training may be completed entirely in a FSTD.
- 2) For proficiency check pilot/line check pilot—aircraft, training in flight in an aircraft supervising normal takeoffs and landings from either pilot seat. The operator must ensure that the check pilot candidate is thoroughly trained in second-in-command functions and capable of accomplishing them competently while supervising and evaluating a new captain.
- 3) Guidelines and safety measures for emergency situations likely to develop in conducting the required normal, abnormal, and emergency procedures in an aircraft and in a simulator, as appropriate.
- 4) The consequences of improper or untimely safety measures.

**C. Flight Training—Flight Engineer Instructors** Flight training must include the following:

- 1) Enough flight training and practice to ensure the instructor's competency. Normal, abnormal, and emergency procedures must be covered. For a flight engineer instructor—all checks, flight training may be completed entirely in a FSTD.
- 2) Guidelines and safety measures for emergency situations likely to develop in conducting the required normal, abnormal, and emergency procedures in an aircraft and in a FSTD, as appropriate.
- 3) Consequences of improper or untimely safety measures.

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### D. Credit for Check Pilot Training—Multiple Operators

1) A POI may approve a check pilot to serve more than one operator. The POI can determine whether equivalent training completed with one operator may be credited toward the check pilot training requirement for another operator. Creditable training may include parts of ground training and flight training. For example, a check pilot might be eligible for training credit under the following conditions:

- Employed as a training center evaluator by a training center
- Regularly performing proficiency or competency checks
- Using the same procedures for all operators

2) When procedures, aircraft, or types of operations differ, the Inspector must require that the check pilot candidate (for service with an additional operator) complete appropriate additional training. Appropriate additional training must address differences, and may comprise entire curriculum segments.

#### 4.20.4.7. FUTURE ACTIVITIES.

- All check pilot and instructors may be subject to a reexamination
- All check pilot and instructors may be the subject of future surveillance

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## VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION

### CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135

#### Section 1. Scope, Concepts and Definitions

**4.21.1.1. TRAINING PROGRAM OVERVIEW.** This chapter contains direction and guidance to be used by General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) responsible for the evaluation, approval, and surveillance of General Authority of Civil Aviation Regulations (GACAR) Part 121 and Part 135 flight crew training programs.

**A.** An applicant for an air operator certificate is required to develop a training program. An existing operator may need to revise its training program when purchasing new equipment, operating in a new environment, obtaining new authorizations, or when new GACA requirements are specified. These new or revised training requirements must be incorporated into an operator's training program. Each Part 121 and Part 135 operator (with the exception of a Part 135 operator using a single pilot in its operation) must obtain GACA approval of curriculums used for training flight crew members, instructors, check pilots, and aircraft dispatchers. The operator is responsible for ensuring that its training program is complete, current, and in compliance with regulations.

**NOTE:** Unless otherwise specified in this chapter, the term "operator" applies equally to an applicant for a certificate and an existing operator.

**B.** It is the policy of the GACA to encourage operators to be innovative and creative when developing training methods and techniques. Principal operations inspectors (POIs) are responsible for ensuring that regulatory requirements are met and that the operator's crew members and dispatchers can competently perform their assigned duties before they are authorized to enter revenue service. POIs are empowered by the President to use discretion, allow latitude, and to exercise judgment concerning the details of training program approval and training techniques that operators use.

**4.21.1.3. DEFINITIONS.** The following terms are used throughout this chapter and are defined as follows:

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**A. Training Program.** A training program is a collection of courses, courseware, facilities, equipment, and personnel necessary to accomplish a specific training objective. This system must satisfy the training program requirements of GACAR Part 121 or Part 135 and ensure that each crew member and dispatcher remains adequately trained for each aircraft, duty position, and kind of operation in which the person serves.

**B. Modular Training.** The concept of program development in which logical subdivisions of training programs are developed, reviewed, approved, and modified as individual units. Curriculum segments and modules may be used in multiple curriculums. The modular approach allows great flexibility in program development and reduces the administrative workload on both operators and instructors in the development and approval of these programs.

**C. Categories of Training.** The classification of instructional programs by the regulatory requirement the training fulfills. Categories of training consist of one or more curriculums. The categories of training are initial new-hire, initial equipment, transition, upgrade, recurrent, and requalification.

**D. Curriculum.** A complete training agenda specific to an aircraft type, a crew member or dispatcher duty position, and a category of training. An example is an “initial new-hire, Boeing 747 pilot curriculum.” Each curriculum consists of several curriculum segments.

**E. Curriculum Segment.** The largest subdivision of a curriculum containing broadly related training subjects and activities based on regulatory requirements. Curriculum segments are logical subdivisions of a curriculum which can be separately evaluated and individually approved. Examples are a “ground training” segment and a “flight training” segment. Each curriculum segment consists of one or more training modules.

**F. Training Module.** A subpart of a curriculum segment which constitutes a logical, self-contained unit. A module contains elements or events which relate to a specific subject. For example, a ground training curriculum segment could logically be divided into modules pertaining to aircraft systems (such as hydraulic, pneumatic, and electrical). As another example, a flight training curriculum segment is normally divided into flight periods, each of which is a separate module. A training module includes the outline, appropriate courseware, and the instructional delivery methods. It is usually, but not necessarily, completed in a single training session.

**G. Element.** An integral part of a training, checking, or qualification module that is not

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task-oriented but subject-oriented. For example, an “electrical power” ground training module may include such elements as a direct current (DC) power system, an alternating current (AC) power system, and circuit protection.

**H. Event.** An integral part of a training, checking, or qualification module which is task-oriented and requires the use of a specific procedure or procedures. A training event provides a student an opportunity for instruction, demonstration, and/or practice using specific procedures. A checking or qualification event provides an evaluator the opportunity to evaluate a student’s ability to correctly accomplish a specific task without instruction or supervision.

**I. Checking and Qualification Module.** An integral part of a qualification curriculum segment which contains checking and qualification requirements specified under Part 121 or Part 135. For example, a qualification curriculum segment may contain a proficiency check module, a Line-Oriented Flight Training (LOFT) module and an operating experience (qualification) module.

**J. Courseware.** Instructional material developed for each curriculum. This is information in lesson plans, instructor guides, computer software programs, audiovisual programs, workbooks, aircraft operating manuals, and handouts. Courseware must accurately reflect curriculum requirements, be effectively organized, and properly integrate with instructional delivery methods.

**K. Instructional Delivery Methods.** Methodology for conveying information to a student. For example, this may include lectures, demonstrations, audiovisual presentations, programmed and directed self-study workshops, and drills. Flight crew training devices, aircraft, and computer work stations are also considered instructional delivery methods.

**L. Testing and Checking.** Methods for evaluating students as they demonstrate a required level of knowledge in a subject; and when appropriate apply the knowledge and skills learned in instructional situations to practical situations.

**M. Training Hours.** The total amount of time necessary to complete the training required by a curriculum segment. This must provide an opportunity for instruction, demonstration, practice, and testing, as appropriate. This time must be specified in hours on the curriculum segment outline. A training hour includes time for normal breaks, usually 10 minutes each hour. Lunch breaks are not included.

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**N. Programmed Hours.** The hours specified in Part 121 for certain categories of training (initial new-hire, initial equipment, and recurrent). Programmed hours are specified in curriculum segment outlines in terms of training hours.

**O. Duty Position.** The functional or operating position of a crew member or aircraft dispatcher. For parts 121 and 135 operations, duty positions are pilot in command (PIC), second in command (SIC), flight engineer (FE), cabin crew member (CCM), and aircraft dispatcher.

**P. Training/Checking Month (Base Month).** The calendar month (Gregorian) during which a crew member or aircraft dispatcher is due to receive required recurrent training, a required flight check, a required competency check, or required operating familiarization. Calendar month means the first day through the last day of a particular month.

**Q. Eligibility Period.** Three calendar-months (the calendar month before the “training/checking month,” the “training/checking month,” and the calendar month after the “training/checking month”). During this period a crew member or aircraft dispatcher must receive recurrent training, a flight check, or a competency check to remain in a qualified status. Training or checking completed during the eligibility period is considered to be completed during the “training/checking month” and is due in the “training/checking month” in the following year.

**R. Initial Approval.** A formal letter which conditionally authorizes an operator to begin instruction to qualify personnel under a specific curriculum or curriculum segment pending an evaluation of training effectiveness. An initial approval letter must specify an expiration date for the conditional authorization.

**S. Final Approval.** A formal letter, without an expiration date, which authorizes an operator to continue training in accordance with a specific curriculum or curriculum segment.

**4.21.1.5. AIRCRAFT FAMILIES.** In order to assist Inspectors in understanding this guidance pertaining to flight crew training programs, it is useful to appreciate that there are essentially five basic families of aircraft used in GACAR Part 121 and 135 operations. The aircraft families are established according to aircraft performance and flight characteristics. The ground and flight training requirements for crew members are significantly different for each family of aircraft. Within each aircraft family, however, the ground and flight training requirements are similar, even though individual aircraft may be quite different in construction and appearance. The five families of aircraft are as follows:

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- Transport category airplanes and rotorcraft, commuter category airplanes and all turbojets
- Turbopropeller-powered small airplanes (both single-engine and multiengine)
- Multiengine reciprocating-powered small airplanes
- Single-engine reciprocating-powered small airplanes
- Non-transport category rotorcraft

Crew members operating airplanes in the multiengine reciprocating-powered small airplane family must have similar knowledge, skills, and abilities to operate them under Part 135. For example, a pilot operating an airplane within this family may require diversified training in short and soft field landings; but is not required to have training in V1 cuts. This type of operation may require specific training, such as seaplane operations.

Crew members operating airplanes in the single engine reciprocating-powered small airplane family must have similar knowledge, skills, and abilities to operate them under Part 135. For example, pilots operating single-engine airplanes are required to have training that applies to all airplanes in this group, such as forced-landing procedures. The type of operation may also require specific training, such as seaplane training.

Crew members operating rotorcraft in the non-transport category rotorcraft family must have similar knowledge, skills, and abilities to operate them under Part 135. General training requirements for this family of aircraft include such events as autorotation and anti-torque failure. The type of operation may also require specific training in events such as high altitude landings.

### **4.21.1.7. TRAINING PROGRAMS: A SCHEMATIC DEPICTION.**

- A. Some elements of a training program are depicted in Figure 4.21.1.1, Schematic Depiction of Training Programs, to show the relationship between the total training program and the categories of training, curriculums, curriculum segments, and training modules. The illustration is representative only and is intended to present a framework for the modular development of a training program. By using this “modular approach,” the POI has various strategies available for the evaluation of training effectiveness and for the planning of long-term surveillance. These strategies are discussed in Section 2 of this chapter.

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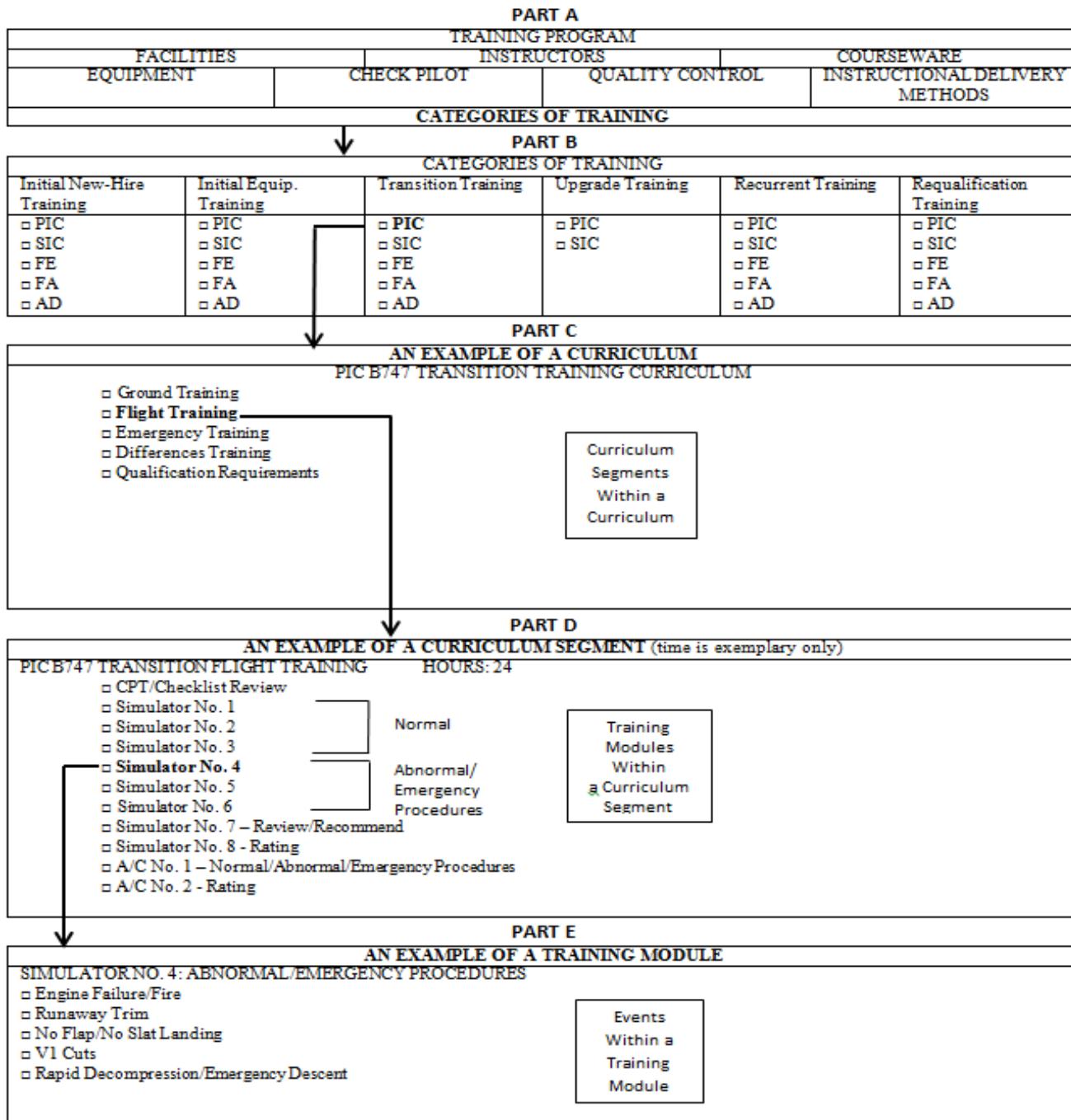
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**B.** The illustration in Figure 4.21.1.1 consists of five parts as follows:

- 1) *Part A* depicts representative components which, when combined, constitute an operator's overall training program. These components differ in that some must be specifically approved by the GACA (for example, courseware and check pilot), while others are accepted as essential supporting elements (for example, facilities and equipment).
- 2) *Part B* illustrates the six categories of training that are recognized by the GACA.
- 3) *Part C* is an example of a curriculum which is a complete agenda of training specific to an aircraft type and crew member or dispatcher duty position. This example depicts a PIC B-747 transition training curriculum.
- 4) *Part D* is an example of a specific curriculum segment and shows that it consists of several training modules. This example is the flight training curriculum segment of the PIC B-747 transition training curriculum.
- 5) *Part E* is an example of a specific training module. In this case the module is simulator lesson number 4.

**Figure 4.21.1.1. Schematic Depiction of Training Programs**

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**4.21.1.9. CATEGORIES OF TRAINING.** There are six basic categories of training applicable to Part 121 and Part 135 operators. The primary factors which determine the appropriate category of

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training are the student's previous experience with the operator and previous duty position. Each category of training consists of one or more curriculums, each one of which is specific to an aircraft type and a duty position (for example: B-747 PIC, B-747 SIC, and B-747 FE). Training should be identified with and organized according to specific categories of training. When discussing training requirements, POI's should be specific regarding the category of training being discussed and use the nomenclature described in this handbook. POIs should encourage operators to use this nomenclature when developing new training curriculums or revising existing training curriculums. Use of this common nomenclature improves standardization and mutual understanding. The six categories of training are briefly discussed in the following subparagraphs:

**A. Initial New-Hire Training.** This training category is for personnel who have not had previous experience with the operator (newly hired personnel). It also applies, however, to personnel employed by the operator who have not previously held a crew member or dispatcher duty position with that operator. Initial new-hire training includes basic indoctrination training and training for a specific duty position and aircraft type. Except for a basic indoctrination curriculum segment, the regulatory requirements for "initial new-hire" and "initial equipment" training are the same. Since initial new-hire training is usually the employee's first exposure to specific company methods, systems, and procedures, it must be the most comprehensive of the six categories of training. For this reason, initial new-hire training is a distinct separate category of training and should not be confused with initial equipment training. As defined by this handbook, initial equipment training is a separate category of training.

**B. Initial Equipment Training.** This category of training is for personnel who have been previously trained and qualified for a duty position by the operator (not new hires) and who are being reassigned for any of the following reasons:

1) For GACAR Part 121 operations, the crew member is being reassigned in one of the following circumstances:

a) Reassignment is to any duty position on an airplane of a different group (Group I is turbopropeller powered and Group II is turbojet powered).

b) Reassignment is to a different duty position on a different airplane type when the flight crew member has not been previously trained and qualified by the operator for that duty position and airplane type.

2) For GACAR Part 135 operations, the crew member is being reassigned in one of the

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following circumstances:

- a) Reassignment is to a different duty position on a different aircraft type and the crew member has not been previously trained and qualified by the operator for that duty position and aircraft type.
- b) Reassignment is to an aircraft of a category or class for which the crew member has not previously qualified with that operator.

**C. Transition Training.** This category of training is for an employee who has been previously trained and qualified for a specific duty position by the operator and who is being assigned to the same duty position on a different aircraft type. For GACAR Part 121 operations, the different type aircraft must be in the same general group of aircraft (i.e. turbopropeller powered airplanes, turbojet powered airplanes, or rotorcraft). If it is not in the same general group, initial equipment training is the applicable category of training.

**D. Upgrade Training.** This category of training is for an employee who has been previously trained and qualified as either second-in-command (SIC) or flight engineer (FE) by the operator and is being assigned as either pilot-in-command (PIC) or SIC, respectively, to the same aircraft type for which the employee was previously trained and qualified.

**E. Recurrent Training.** This category of training is for an employee who has been trained and qualified by the operator, who will continue to serve in the same duty position and aircraft type, and who must receive recurring training and/or checking within an appropriate eligibility period to maintain currency.

**F. Requalification Training.** This category of training is for an employee who has been trained and qualified by the operator, but has become unqualified to serve in a particular duty position and/or aircraft due to not having received recurrent training and/or a required flight or competency check within the appropriate eligibility period. Requalification training is also applicable in the following situations:

- 1) PICs who are being reassigned as SICs on the same aircraft type when seat-dependent training is required; and
- 2) PICs and SICs, who are being reassigned as FEs on the same aircraft type, provided they were previously qualified as FEs on that aircraft type.

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**G. Summary of Categories of Training.** The categories of training are summarized in general terms as follows:

- 1) All personnel not previously employed by the operator must complete initial new-hire training.
- 2) All personnel must complete recurrent training for the duty position and aircraft type for which they are currently assigned within the appropriate eligibility period.
- 3) All personnel who have become unqualified for a duty position on an aircraft type with the operator must complete requalification training to reestablish qualification for that duty position and aircraft type.
- 4) All personnel who are being assigned by the operator to a different duty position and/or aircraft type must complete either initial equipment, transition, upgrade, or requalification training, depending on the aircraft type and duty position for which they were previously qualified. Figure 4.21.1.2, Categories of Training In Part 121 Operations, and Table 4.21.1.1, Categories of Training In Part 135 Operations, summarize these categories of training for Part 121 and Part 135 respectively. These figures/tables indicate the appropriate category of training for normal crew member progression or reassignment. They may not address certain situations. The guidance in this paragraph and the requirements of appropriate regulations must be followed when the tables do not address such situations.

**Figure 4.21.1.2. Categories of Training In Part 121 Operations**

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This table illustrates categories of training for personnel being assigned to either a different duty position, a different airplane type, or a different airplane group with the same Part 121 operator.

ASSIGNED DUTY POSITION

TABLE KEY

PPC = Pilot-in-Command      1 = Turbopropeller-powered

If current duty position is SIC on airplane type B, a turbo-jet powered airplane

SSIC = Second-in-Command      2 = Turbojet-powered

Being assigned as PIC on same airplane type B; then upgrade training (U) is required.

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**Table 4.21.1.1. Categories of Training In Part 135 Operations**

**NOTE:** This table illustrates categories of training

	PIC (A)	PIC (B)	SIC (A)	SIC (B)	
CURRENT DUTY POSITION	PIC A	R*	T	R	I
	PIC B	T	R*	I	R
	SIC A	U	I	R*	T
	SIC B	U	U	T	R*
Required Categories of Training: T = Transition Training I = Initial Equipment Training U = Upgrade Training R = Requalification Training R* = Requalification required if person has become unqualified					

**TABLE KEY:**

PIC = pilot in command  
SIC = second in command

**EXAMPLE:**

1. Current duty position is SIC on aircraft type A. Person is assigned to PIC duty position type on same aircraft type. Upgrade Training is required.

**4.21.1.11. APPLICABILITY OF TRAINING CATEGORIES.** Usually, operators will need to conduct training in all six categories of training. Recurrent training applies to all operators. Initial equipment training, transition training, upgrade training, and requalification training apply in most situations. However, transition training is not applicable for an operator who operates only one aircraft type. Initial new-hire training applies to operators who train and qualify newly hired personnel or personnel who have not been previously qualified as a crew member by that operator. Abbreviated curriculum segment outlines of initial new-hire training may apply to merger or air carrier acquisition situations. See additional guidance in Volume 4, Chapter 4, Section 2, Air Operator Mergers and Acquisition of Air Operator Operational Assets.

**4.21.1.13. CURRICULUM DEVELOPMENT.** Operators must develop one or more curriculums for each category, specific duty position, and aircraft type in which the operator conducts training.

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**A. Required Curriculums.** The operator is required to develop and maintain only those curriculums that will be used. For example, if an operator specifies that all newly hired pilots must be trained first as B-747 FEs, the appropriate curriculum for that category of training would be B-747 FE initial new-hire training. The operator would not be required to develop any initial new-hire pilot training curriculums for other aircraft or duty positions. Another example would be if a Part 135 operator specifies that all newly hired pilots must be trained first as SICs on the BE 99, then only a BE-99 SIC initial new-hire training curriculum would need to be developed and maintained.

**B. Types of Single-Engine Reciprocating-Powered Small Airplanes.** A GACAR Part 135 operator may consider all makes and models of airplanes in this family of aircraft as a single “type” when determining the need to construct a curriculum (see paragraph 4.21.1.5 of this section).

**C. Types of Multiengine Reciprocating-Powered Small Airplanes.** A GACAR Part 135 operator may consider all makes and models of airplanes in this family of aircraft as a single “type” when determining the need to construct a curriculum (see paragraph 4.21.1.5 of this chapter). Operators must provide differences training to qualify crew members in different models of aircraft considered the same “type” for this purpose.

**D. Types of Transport Category, Commuter Category, and Turbine-Powered Airplanes.** An operator may consider each model of transport category, commuter category, turbine-powered airplane or a rotorcraft as a “type” when determining the need to construct a curriculum. Operators must provide differences training to qualify crew members in different models of aircraft considered the same “type” for this purpose.

**E. Multiple Curriculums of a Single Category.** Operators may develop and have multiple curriculums approved for any single duty position and aircraft type. For example, an operator may have one initial new-hire curriculum approved for pilots with minimum hours and without any previous revenue experience. A second curriculum could then be approved for pilots previously qualified in service in the type of aircraft for which training is being conducted. Operators that develop multiple curriculums must carefully specify the qualifications of students in each curriculum. Some acceptable means that operators may use include the following:

- 1) Documentation such as training records from previous employers showing the extent and scope of previous training; and

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2) Validated pre-testing.

**F. Curriculum Outlines.** Curriculum outlines are documents used by operators to specify the curriculum content. This information is required so that the POI can determine whether the operator's curriculum meets regulatory requirements during Phase Three of the approval process. Curriculum outlines should contain enough detail so that lesson plans can later be constructed from them. Other information is not necessary, and POIs should discourage operators from including it. Detailed information should be placed in lesson plans, training manuals, and other documents maintained by the operator. This material is reviewed during Phase Four of the approval process. See Section 2 for additional guidance on the training program approval process.

**G. Completion Requirements.** Each person required to train under a curriculum must complete that curriculum in its entirety. Each student must satisfactorily complete all curriculum segments prescribed by an approved training curriculum. When a person has completed the training and checking specified by a curriculum, that person is qualified to serve in a specific duty position on a specific aircraft type.

**4.21.1.15. CURRICULUM SEGMENTS.** Curriculum segments which make up a curriculum depend upon the category of training and the duty position. The curriculum segments which must be included in each curriculum for each category of training are outlined in Figure 4.21.1.3, Categories of Training, Curriculums, and Curriculum Segments. Each curriculum consists of specific curriculum segments. A curriculum segment consists of a group of broadly related training subjects and activities based on regulatory requirements. Curriculum segments are titled as follows:

- Basic Indoctrination - GACAR §§ 121.879(a)(1) or 135.387(a)(1)
- Aircraft Ground Training - GACAR §§ 121.887 through 121.422 or 135.387(a)(2)
- Emergency Training - GACAR §§ 121.907 or 135.389
- Flight Training - GACAR §§ 121.899, 121.903 or 135.387(b)
- Special Curriculum Segment - Various rules depending on the operation
- Transportation of Dangerous Goods (Carriage or Non-Carriage) - GACAR Part 109 and §§ 121.1609, 135.745

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- Qualification Segment - GACAR Part 121, Subpart K, or GACAR §§ 135.349 through 135.353

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**Figure 4.21.1.3. Categories of Training, Curriculums, and Curriculum Segments**

		CATEGORIES OF TRAINING														
		TRAINING FOR CREWMEMBERS/DISPATCHERS PREVIOUSLY QUALIFIED BY THE OPERATOR														
		INITIAL EQUIPMENT TRAINING			TRANSITION TRAINING			UPDATE TRAINING			RECURRENT TRAINING			QUALIFICATION TRAINING **		
CURRICULUMS FOR SPECIFIC WITI POSITION AND AIRCRAFT																
		PIC	SIC	RE	PA	AU	PIC	SIC	RE	PA	AU	PIC	SIC	RE	PA	AU
BASIC	INDOCTRINATION	0	0	0	0	0										
AIRCRAFT GROUND	C TRAINING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EMERGENCY	E TRAINING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FLIGHT	F TRAINING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIFFERENCES	D TRAINING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPECIAL SEGMENT (IF APPLICABLE)	S IF APPLICABLE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QUALIFICATION	Q SEGMENT	THIS CURRICULUM SEGMENT VARIES WITH THE COMPANY'S OPERATIONAL NEED OR AUTHORIZATIONS ( AT II LR NAV, ETC.)														
O APPROPRIATE FLIGHT CHECK	O COMP CHECK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O IOE	O FAM FLIGHT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O LINE CHECK		0														0

\* A proficiency check may be substituted for the recurrent flight training curriculum segment. \*\* The curriculum segments for requalification training depends upon the period of time the crewmember/dispatcher has been unqualified.

**4.21.1.17. TRAINING MODULE CONSTRUCTION (ELEMENTS OR EVENTS).** Curriculum segments consist of training modules. Training modules are in turn constructed of elements or events

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arranged in a logical sequence. Curriculum segments and modules should be constructed so that instruction proceeds from the most basic concept and skill to the more advanced in a building block approach. When the phrase “training module” is used, it refers to the complete courseware and instructional delivery method used by the operator to convey the information required in the training module outline. The phrase “training module outline,” as used in this handbook, refers to the outline of a module incorporated in a curriculum segment for submission to the President for purposes of approval.

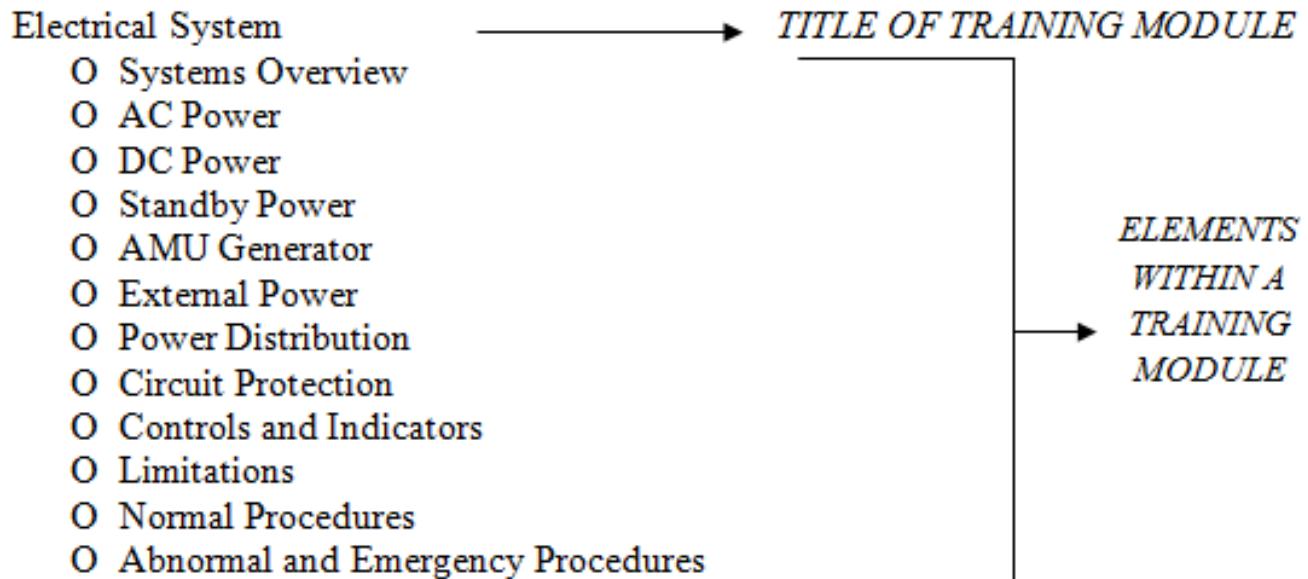
A. Operators should present training modules to the POI in outline form for initial approval. The following are examples of training module outlines. These are only examples and are not intended to imply the only acceptable methods, sequence of instructional delivery, subject titles, or amount of detail.

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Table 4.21.1.2. Example of Related “Elements” In an Aircraft Ground Training Module Outline:

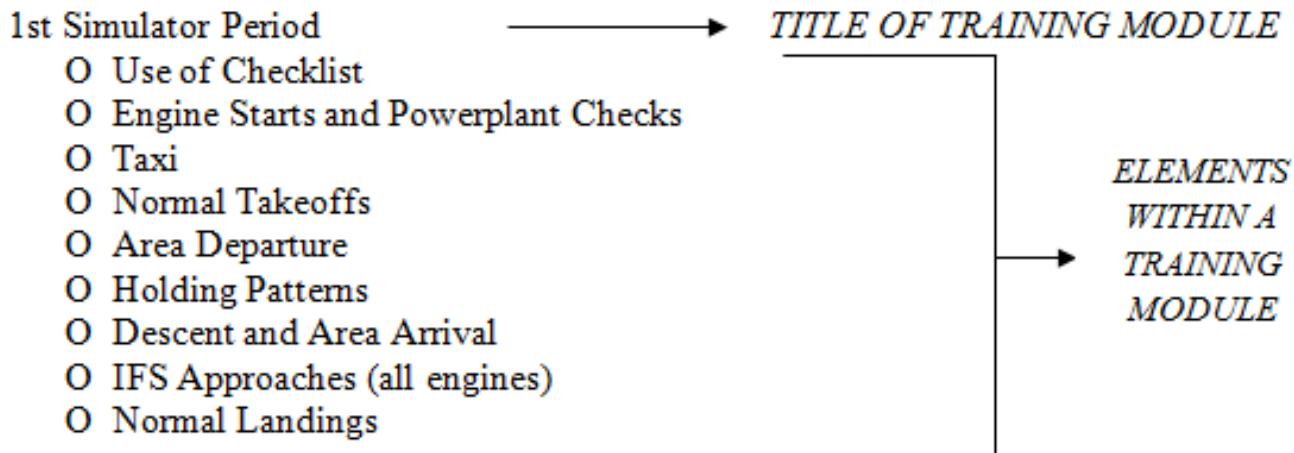


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**Table 4.21.1.3. Example of Related “Events” In a Flight Training Module Outline:**



**B.** Operators must construct training module outlines with enough detail to ensure that the POI can identify that the essential features of the subject have been addressed and that regulatory requirements have been met. The training module outline will later serve as a foundation from which the operator will develop complete and usable courseware and select appropriate instructional delivery methods. The effectiveness of courseware and instructional delivery methods cannot be evaluated before instruction begins and must, therefore, be evaluated as a final step in the approval process. Excessive detail is neither necessary nor helpful to the POI during the initial approval process.

- 1) In the development of a training module, the operator may consider the students' previous experience and training. Previous experience considerations include past experience in Part 121 or Part 135 operations; past experience with the operator's systems, methods and procedures, previous duty positions; and previous experience with an aircraft type.
- 2) Once approved, training module outlines normally remain relatively fixed, requiring adjustment only when new elements are introduced. For example, existing training outlines require the addition of an Airborne Collision Avoidance System (ACAS) and operations module with the introduction of ACAS.
- 3) One reason for excluding excessive detail from the training module outline is to allow the operator flexibility in adjusting courseware without time-consuming and unnecessary reviews on the part of the POI. During the final approval process and beyond, the operator

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is free to make adjustments determined necessary on the basis of experience to courseware that does not add or delete elements or events from the outline. POIs may also find it necessary, on the basis of surveillance reports or other information, to require the operator to modify courseware and course outlines.

**C.** Curriculum segments are composed of training modules. The scope and content of each training module depends upon the category of training and the curriculum in which the curriculum segment is to be incorporated. The number and content of modules for a particular curriculum segment may vary from one category of training to another. For example, aircraft ground training modules in the upgrade training category may not need to be as comprehensive as the aircraft ground training modules in the initial equipment category of training. The amount of detail in each module determines the time required to present the instructional material in a curriculum segment. The amount of detail also controls the development of courseware, such as lesson plans and the flight maneuvers and procedures documents.

**D.** A single module may be used in more than one curriculum and in more than one category of training. For example, a module which specifies a review of emergency evacuation procedures for recurrent training could be the same for requalification training. POIs should, however, encourage operators to develop courseware which places emphasis on the particular category of training. For example, PIC upgrade training should emphasize duty position responsibilities. The emphasis in SIC upgrade training (FE to SIC), however, should be on piloting skills as well as on the requirements of the new duty position. Transition training should emphasize aircraft systems and the procedures and piloting skills needed to operate a different aircraft type. In many cases, operators may develop different sets of courseware from a single outline to cover differences in emphasis.

**E.** Checking and qualification curriculum modules consist of those events required by regulation to act in revenue service without supervision.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 2. Training Approval Process**

###### **4.21.2.1. GENERAL.**

**A. Overview.** Training curriculum approvals follow the Five-Phase general process for approval or acceptance described in Volume 1, Chapter 4, Section 1, General Information and the Approval or Acceptance Process. The basic steps of this process must be followed. Each phase, however, may be adjusted to accommodate existing circumstances. Depending on the complexity of the operator's request and the availability of the General Authority of Civil Aviation (GACA) resources, the approval process may be accomplished in just a few days, or may last many months. The approval process applies to each operator requesting approval of a new curriculum or a revision to a currently-approved curriculum. Inherent in the approval process is the GACA's responsibility to deny approval of any training which does not meet regulatory requirements or which has been found deficient. Training curriculums which have been granted approval and later found either to be in conflict with regulatory requirements or to be ineffective must be appropriately modified by the operator, or GACA approval must be withdrawn. This section establishes procedures for granting approval or withdrawing approval of all or part of a training curriculum. When appropriate, job aids have been developed to assist Inspectors in the approval process of curriculum segments. These job aids are discussed in subsequent sections of this chapter.

**B. Applicability.** The training approval process discussed in this section applies only to General Authority of Civil Aviation Regulation (GACAR) Part 121 and Part 135 operators. Part 121, Subpart L training can be approved for only GACAR Part 121 operators and Part 135, Subpart L training can be approved for only GACAR Part 135 operators.

###### **4.21.2.3. INITIATING THE APPROVAL PROCESS—PHASE ONE**

**A. Approval Process Initiation.** The training approval process can be initiated by either the operator or the GACA as follows:

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1) *Operator Initiated.* The operator informs the GACA that it is planning to establish a new training curriculum or to change an existing curriculum.

2) *GACA Initiated.* The GACA informs an operator that revisions to its training program are required based on recently acquired information relative to training techniques, aviation technology, aircraft operational history, operator performance, or regulatory changes.

**B. Needed Information.** When a proposal is initiated by the operator, one of the first steps the principal operations inspector (POI) should take is to obtain the following basic information:

- Type of operation
- Type of equipment to be operated
- Geographic areas of operation
- Proposed training schedules
- Proposed date of revenue operations
- Proposed contract training, if any
- Type of training device to be used, if any
- Facilities to be used

### 4.21.2.5. GACA INVOLVEMENT - PHASE ONE.

**A. POI Responsibilities.** Early in the process, the POI and the operator should establish, through discussion, a common understanding of both the regulatory training requirements and the direction and guidance provided in this handbook. The POI and the operator must examine the entire operation to ensure that any training necessitated by operational requirements, authorizations, or limitations (such as those in the operations specifications (OpSpecs), minimum equipment lists (MEL) and exemptions), is included in the operator's training curriculums. The training program is the area most affected by operational changes. The POI should review all general requirements in the regulations and in this handbook that apply to the proposed operation. The POI should be aware of changes to the information initially provided

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by the operator. The POI should discuss with the operator the sequence and timing of events which occur in the development and the granting of initial and final approval of a training curriculum. If the operator's proposal involves complex operations such as Extended Range Operations (ETOPS) or polar operations, the POI must consult appropriate sections of this handbook and other relevant documents and be prepared to advise the operator during this phase. In such a case, the POI should also determine whether assistance from another aviation safety inspector (Inspector) is necessary.

**B. Advice and Guidance Given to the Operator.** An Inspector should be prepared to provide advice to an operator during training curriculum development. During Phase One, the operator must be informed of the procedure for requesting initial approval and of the additional supporting information which the POI will require the operator to submit in order to get program approval. An Inspector should be prepared to provide advice and guidance to the operator on the following:

- The general format and content of curriculums, curriculum segments, training modules, and flight maneuvers and procedures documents
- Courseware
- Facilities
- Qualifications of instructor personnel
- Other areas of the operator's proposed training program

**C. Importance of Early Involvement.** Early GACA involvement is also important for the following reasons:

- GACA advice and guidance during development of training may provide a useful service to the operator. This advice may save the operator and the GACA from unnecessary use of resources. It may also prevent the operator from submitting a training curriculum proposal which would not be approved by the POI
- The POI can become familiar with the material the operator intends to submit. This facilitates review of the proposal before the granting of initial approval

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- The POI can begin planning long-range needs, such as qualification of Inspectors on the operator's aircraft, and evaluation of the program's overall effectiveness
- Early Inspector involvement in the development of training programs is appropriate. An Inspector, however, must act in an advisory capacity only. The Inspector must avoid active participation in the actual training program development. The operator is responsible for the development of its own training program. The Inspector must not assume that responsibility.

**D. Additional Help.** As the operator's proposals solidify, any significant requirements which may affect Inspector resources should be discussed with the Office Manager. An Inspector may need training on an operator's aircraft type.

**E. Potential Causes of Approval Delays.** The operator should be aware of the potential for delays in approval. Such delays may be caused by any of the following reasons:

- The applicant for a certificate not meeting the schedule of events
- The operator failing to expeditiously transmit information to the POI
- A change in plans, for example, changing either the training locations or the type of aircraft
- Inadequate, insufficient, or unclear material submitted in Phase Two
- Deficiencies in the training discovered during Phases Two, Three, or Four
- Delays in obtaining equipment (such as flight crew training device) or device approval
- Higher priority work (such as accidents) assigned to the POI or other Inspectors associated with the training approval process

### **4.21.2.7. REQUESTS FOR INITIAL APPROVAL - PHASE TWO.**

**A. Overview.** Phase Two begins when the operator submits its training proposal in writing, for initial approval, to the POI. The operator is required to submit to the POI an outline of each curriculum or curriculum segment and any additional relevant supporting information requested by the POI. These outlines, any additional supporting information, and a letter must be submitted to the POI. This letter should request POI approval of the training curriculum. Two

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copies of each curriculum or curriculum segment outline should be forwarded along with the letter of request to the POI.

**B. Required Information in Curriculums.** Each operator must submit its own specific curriculum segment outlines appropriate for its type of aircraft and kinds of operations. These outlines may differ from one operator to another and from one category of training to another in terms of format, detail, and presentation. Each curriculum should be easy to revise and should contain a method for controlling revisions, such as a revision numbering system. Curriculums for different duty positions may be combined into one document provided the positions are specifically identified and any differences in instruction are specified for each duty position. Each curriculum and curriculum segment outline must include the following information:

- Operator's name
- Type of aircraft
- Duty position
- Title of curriculum and/or curriculum segment including the category of training
- Consecutive page numbers
- Page revision control dates and revision numbers

**C. Required Curriculum Segment Items.** Each curriculum and curriculum segment must also include the following items, as appropriate:

- 1) Prerequisites prescribed by the General Authority of Civil Aviation Regulations (GACARs) or required by the operator for enrollment in the curriculum.
- 2) Statements of objectives of the entire curriculum and a statement of the objective of each curriculum segment.
- 3) A list of each training device, mockup, system trainer, procedures trainer, simulator, and other training aids which require POI approval (The curriculum may contain references to other documents in which the approved flight crew training devices and aids, are listed).

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- 4) Descriptions or pictorial displays of normal, abnormal, and emergency maneuvers and procedures which are intended for use in the curriculum, when appropriate (These descriptions or pictorial displays, when grouped together, are commonly referred to as the flight maneuvers and procedures document. The operator may choose to present detailed descriptions and pictorial displays of flight maneuvers and procedures in other manuals. For example, the flight maneuvers and procedures document may be described in an aircraft operating manual. However, as a required part of the training curriculum, it must either be submitted as part of the curriculum or be appropriately referenced in the curriculum).
- 5) An outline of each training module within each curriculum segment (Each module should contain sufficient detail to ensure that the main features of the principal elements or events will be addressed during instruction).
- 6) Training hours which will be applied to each curriculum segment and the total curriculum.
- 7) The checking and qualification modules of the qualification curriculum segment used to determine successful course completion, including any GACAR qualification requirements for crew members or dispatchers to serve in Part 121 or Part 135 operations (such as initial operating experience, line checks, operating familiarization).

**4.21.2.9. ADDITIONAL RELEVANT SUPPORTING INFORMATION.** As specified in GACAR § 121.851(a)(2) and 135.381(a)(2), an operator must submit any additional relevant supporting information requested by the POI. The information required for approval may be additional information that the POI finds necessary for determining whether the proposed training program is feasible and adequately supported. It is information which would be difficult to include in a curriculum outline format. The type and amount of supporting information needed will vary depending on the type of training, aircraft types to be operated, and kinds of operations. The POI must determine the appropriate types of supporting information to be required. This should be limited to only that information critical to the determination of the proposed training program's acceptability. The following list of types of relevant supporting information is not all-inclusive, but includes information that is typical.

**A. Description of Facilities.** A description of facilities is appropriate if the POI is unfamiliar with the facilities, or if the facilities are not readily available for examination.

**B. List of Ground and Flight Instructors and Qualifications.** A list of ground and flight

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instructors and their qualifications may be requested. This information is particularly important if the operator intends to use contract instructors. The POI should determine whether the proposed instructors meet regulatory requirements and if they are qualified to conduct training.

**C. Description of Flight Crew Training Devices.** A detailed description of each flight simulation training device (FSTD) and aviation training device (ATD) is appropriate when the training device is not readily available for the POI's examination. This detailed description is particularly important when the operator intends to contract for a specific FSTD or ATD. This description should provide sufficiently detailed information to enable the POI to determine whether the training and checking to be conducted is appropriate for the level of the SIM or training device to be used.

**D. Description of Qualification and Enrollment Prerequisites.** A detailed description of minimum student qualifications and enrollment prerequisites is appropriate when such prerequisites are not described in detail in the curriculum. Examples of these prerequisites which may need to be detailed as supporting information include: type of airman certificate, aircraft type qualifications, previous training programs, minimum flight hours, any experience with other Part 121 or Part 135 operators, and recency of experience. This description may be useful to the POI when determining whether the proposed amount of detail outlined in training modules and the proposed training hours are adequate.

**E. Recordkeeping Requirements.** Copies of training forms and records to be used for recording student progress and the completion of training may be required. This ensures the operator has planned for the GACAR recordkeeping requirements. This type of supporting information shall be required of applicants for an air operator certificate (AOC). It may also be required of operators with any significant revision to existing training programs. These forms, records, or computer transmittal worksheets must be designed so that attendance and course-completion information is recorded and retrievable for verifying regulatory compliance.

**F. Supporting Information.** Supporting information may include samples of courseware, such as lesson plans and instructor guides. Descriptions of other types of courseware, such as home study, computer-based instruction (CBI), and Line Oriented Flight Training (LOFT) scenarios, should be in enough detail to provide an understanding of how the training will be administered and of the proposed instructional delivery method. This information should describe the instructor student-interaction and indicate methods for measuring student learning.

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**4.21.2.11. INITIAL REVIEW OF REQUESTS FOR APPROVAL.** In Phase Two the POI must review the submitted training curriculum and supporting information for completeness, general content, and overall quality. A detailed examination of the documents is not required during Phase Two. If after initial review, the submission appears to be complete and of acceptable quality, or if the deficiencies are immediately brought to the operator's attention and can be quickly resolved, the POI may begin the Phase Three in-depth review. If the submission is determined to be incomplete or obviously unacceptable, the approval process is terminated and the POI must immediately return the documents with an explanation of the deficiencies. The documents must be immediately returned, so the operator will not erroneously assume the POI is continuing the process to the next phase. The approval process can be resumed when the revised training curriculum or curriculum segment is resubmitted.

**4.21.2.13. TRAINING CURRICULUMS SUBMITTED WITH THE APPLICATION.** An applicant for an AOC, in the early stages of certification may be unable to provide all information required for its training program. For example, the applicant may not yet know what training facilities or devices it intends to use. The lack of such information in the formal application does not necessarily indicate that the training curriculum attachment be returned. There should be an understanding between the applicant and the POI that such portions are missing. The POI may initiate the Phase Three in-depth review without this type of information. Initial approval, however, of a curriculum segment must be withheld until all portions pertinent to the curriculum segment have been examined. For example, it may be appropriate to initially approve a ground training curriculum segment even though the flight crew training device has not yet been evaluated and approved for flight training. However, effective evaluation of training curriculums can be hampered when an excessive number of incomplete curriculum segments are permitted. The POI shall either delay initial approval of training curriculums or return them to the applicant when an excessive number of incomplete curriculum segments have been submitted with the formal application.

### **4.21.2.15. IN-DEPTH REVIEW OF SUBMITTED CURRICULUMS - PHASE THREE.**

**A. General.** Phase Three is initiated when the POI begins a detailed analysis and evaluation of a training curriculum or curriculum segment. The purpose of this phase is to determine the acceptability of training curriculums for initial approval. This phase ends either with the initial approval or with the rejection of all or part of the training curriculum. To complete an evaluation in a timely manner the POI may need to involve other Inspector personnel early in this phase.

**B. Required Evaluations.** Before granting initial approval for a specific curriculum or curriculum

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segment, the POI must ensure that the following evaluations are accomplished:

- 1) A side-by-side examination of the curriculum outline with the appropriate regulations and with the direction provided in this handbook must be performed. This examination is to ensure that training will be given in at least the required subjects and in-flight training maneuvers. It should also ensure that appropriate training will be given on safe operating practices.
- 2) An examination of the courseware developed or being developed by the operator must be performed. This review should include a sampling of available courseware such as lesson plans, audiovisual programs, flight maneuvers and procedures documents, and student handouts. The courseware must be consistent with each curriculum and curriculum segment outline. From this review, the POI should be able to determine whether the operator is capable of developing and producing effective training courseware.
- 3) An inspection of training facilities, training devices, and instructional aids (which will be used to support the training) must be performed if the POI is not familiar with the operator's training program capabilities.
- 4) The training hours specified in each curriculum segment outline must be evaluated. An Inspector should not attempt to measure the quality or sufficiency of training by the number of training hours alone. This can only be determined by direct observation of training and testing (or checking) in progress, or by examination of surveillance and investigation reports. The specified training hours must be realistic, however, in terms of the amount of time it will take to accomplish the training outlined in the curriculum segment so as to achieve the stated training objectives. During the examination of courseware, an Inspector should note the times allotted by the operator for each training module. These times should be realistic in terms of the complexity of the individual training modules. The number of training hours for any particular curriculum segment depends upon many factors. Some of the primary factors are as follows:
  - Complexity of the specific aircraft
  - Complexity of the type of operation
  - Amount of detail that needs to be covered

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- The experience and knowledge level of the students
- Efficiency and sophistication of the operator's entire training program (including items such as instructor proficiency, training aids, facilities, courseware, and the operator's experience with the aircraft)

**C. Criteria for Approval.** If after completing these evaluations, the POI determines that the curriculum or curriculum segment is satisfactory and adequately supported, and that the training hours are realistic, initial approval should be granted. Sometimes a portion of the submittal may appear to be satisfactory. However, if that portion is dependent upon another undeveloped portion or another unsatisfactory portion, initial approval must be withheld. For example, a "PIC BE-100 initial equipment, flight training curriculum segment" is satisfactory but related training modules within the initial equipment ground training curriculum segment are unsatisfactory. In such a case, it may be inappropriate to grant initial approval to the initial equipment flight training curriculum segment until the ground training curriculum segment is determined to be satisfactory.

**D. Establishment of Priorities.** During Phase Three of the approval process, the POI must establish priorities to ensure that, if appropriate, the granting of an initial approval is not unnecessarily delayed. These priorities should assure that deficiencies are resolved so that initial approval can be granted before the operator's planned starting date for training.

**4.21.2.17. EXPIRATION DATES FOR INITIAL APPROVALS.** When the POI determines that a training curriculum or curriculum segment should be initially approved, the POI must also determine an appropriate expiration date for the initial approval. The expiration date is important throughout Phase Four of the approval process. GACAR §§121.839(b) and 135.377(a)(1) require the operator to obtain final approval of training curriculums. The expiration date provides an incentive to the operator for refining all aspects of the program to assure that this regulatory requirement is met. The expiration date also provides the POI with a time frame with which to plan evaluation activities for determining the effectiveness of the training. The expiration date assigned to an initially approved training curriculum must not exceed 24 months from the date of initial approval. The expiration date of initial approval may be reduced by the POI if it is apparent that a 24-month time frame will unnecessarily delay final approval. The POI should be aware that shortening the initial approval expiration date will commit him to completing the final approval phase within the shorter time period. The POI may grant final approval any time before the expiration date. Except when unforeseen circumstances preclude an adequate evaluation of training effectiveness, an extension to the initial

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approval expiration date should not be permitted. A new expiration date, however, may be established for a curriculum segment when there are significant revisions to an initially approved curriculum segment.

### **4.21.2.19. METHOD OF GRANTING INITIAL APPROVAL.**

**A. Initial Approval is Granted by Letter.** Sample letters granting initial approval are included at the end of this section (Figures 4.21.2.1, Letter of Initial Approval (Part 135) and 4.21.2.2, Letter of Initial Approval (Part 121)). The initial approval letter must include at least the following information:

- Specific identification of the curriculums and/or curriculum segments initially approved including page numbers and revision control dates
- A statement that initial approval is granted, including the effective and expiration dates
- Any specific conditions affecting the initial approval, if applicable
- A request for advance notice of training schedules so that training may be evaluated in accordance with GACAR § 121.851 or § 135.381, as appropriate
- If the POI is authorizing a reduction in the programmed hours specified by Part 121, a statement concerning the basis for reduction

**B. Other Acceptable Methods.** An initial approval letter serves as the primary record of curriculum or curriculum segment pages that are currently effective. In the past, initial approval was stamped on each page of a curriculum. Although this method is no longer necessary, the POI and each operator may agree to use the method to account for revisions to training documents. If this method is used, the stamp must clearly indicate initial approval and the expiration date. Other acceptable methods include a list of effective curriculum or curriculum segment pages, or pages with a preprinted signature and date blocks.

**C. Return of Originals.** The original pages of the curriculum or curriculum segment shall be returned to the operator with the transmittal letter. These documents should be retained by the operator as an official record. A copy of the training curriculum or curriculum segment, with a copy of the transmittal letter granting initial approval attached, shall be maintained on file in the GACA office by the POI during the period that the initial approval is valid. The POI shall also

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maintain on file with the curriculum all additional relevant supporting information.

**4.21.2.21. METHOD OF DENYING INITIAL APPROVAL.** If the POI determines that initial approval of a proposed training curriculum or curriculum segment must be denied, the operator shall be notified in writing of the reasons for denial. This letter must contain an identification of the deficient areas of the training curriculum and a statement that initial approval is denied. It is not necessary that each minor deficiency which resulted in the denial be identified; however, the major deficiencies should be outlined in the letter. It is the operator's responsibility to redevelop or correct the deficient area before resubmission to the POI. A copy of the denial letter and a copy of the proposed training curriculum or curriculum segment shall be kept on file in the responsible GACA office. See Figure 4.21.2.3 for a sample letter of the denial of an initial approval.

### **4.21.2.23. EVALUATING INITIALLY APPROVED TRAINING CURRICULUMS—PHASE FOUR.**

**A. Overview.** Phase Four begins when the operator starts training under the initially-approved curriculum. This phase should provide the operator with adequate time to test the program and the flexibility to adjust the program during POI evaluation. The POI must require an operator to provide ongoing schedules of all training and checking to be accomplished under an initially-approved training curriculum. The POI must closely monitor training conducted under initial approval. Whenever possible, the first session of training conducted under initial approval should be monitored by the POI or a qualified operations Inspector. An Inspector does not need to observe every training session. A sufficient sampling of the training sessions, however, should be observed as a basis for a realistic evaluation. Inspectors qualified in the type aircraft, and other individuals knowledgeable of the curriculum subject matter, should assist in evaluating the training. During training under initial approval, the operator is expected to evaluate and appropriately adjust training methods as needed. Often adjustments can be made by changing courseware and instructional delivery without (or with only minor) revisions to the initially approved curriculum. Conversely, it may be necessary for the operator to substantially change the curriculum which may require another initial approval action by the POI before the changes can be put into effect. Sometimes proposed revisions may be transmitted to the POI just before the initial approval expiration date. If the change is significant, the POI may need to establish a different expiration date for the curriculum segment, or for the revised portions, to allow adequate time for a proper evaluation.

**B. Identification and Correction of Curriculum Deficiencies.** During Phase Four, the operator

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must demonstrate the ability to effectively train crew members and dispatchers. Each deficiency identified during the evaluation of training conducted under an initially-approved curriculum must be discussed with the operator. If the deficiencies are significant, they must be documented and kept on file. In most cases, when the cause of a deficiency has been accurately identified, the operator will make the necessary changes to correct the deficiency to obtain final approval. Each significant deficiency which has been accurately identified must be immediately corrected. If an operator does not take appropriate corrective action, the POI shall advise the operator in writing that initial approval is withdrawn (see paragraph 4.21.2.35).

**4.21.2.25. ELEMENTS AVAILABLE FOR EVALUATING TRAINING—PHASE FOUR** The POI must develop a plan for systematically evaluating training given under the initially approved training curriculum. This plan should remain in effect throughout the initial approval period. There are five elements which can be evaluated when assessing the overall effectiveness of training programs. These five elements are: curriculum segment outlines, courseware, instructional delivery methods and training environment, testing and checking, and surveillance and investigation of operator activities. These elements are interrelated; however, each can be separately evaluated. See Table 4.21.2.1 for a summary of the five elements.

**A. Curriculum Segment Outlines.** Before evaluating a training program, an Inspector must become familiar with the contents of the curriculums or curriculum segments to be evaluated. This preparation is essential if an Inspector is to determine whether an operator has developed an effective course of instruction from its initially approved training curriculum.

**B. Examination of Courseware.** Direct examination of courseware includes reviewing materials such as lesson plans, workbooks, or flight instructor guides. The Inspector must determine whether the courseware is consistent with the curriculum or curriculum segment and that it has been organized to facilitate effective instructional delivery. Courseware is usually the training program element which is most adaptable to revision or refinement. Inspectors must review at least a sampling of the courseware.

**C. Observation of Instructional Delivery Methods and Training Environments.** Direct observation of instructional delivery includes surveillance of training methods, such as instructor lectures, CBI presentations, and in-flight instruction. Effective learning can only occur when an instructor is organized, prepared, and properly uses the courseware and various training aids. The Inspector must determine that the instructional delivery is consistent with the courseware. For example, the Inspector should note whether the instructor teaches the topics

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specified in the lesson plan. Training aids and devices should function as intended during the instructional delivery. In addition, during training, the Inspector should be sensitive to the type of questions being asked by students and should identify the reasons for any excessive repetition. These conditions may indicate ineffective instructional delivery or courseware. The Inspector must also determine if the instructional environment is conducive to learning. Distractions which adversely affect instructional delivery, such as excessive temperatures, extraneous noises, poor lighting, cramped classrooms or workspaces, are deficiencies because they interfere with learning.

**D. Observation of Testing and Checking.** Direct observation of testing and checking is an effective method for determining whether learning has occurred. Examining the results of tests, such as oral or written tests or flight checks, provides a quantifiable method for measuring training effectiveness. The POI must examine and determine the causal factors of significant failure trends.

**E. Surveillance and Investigation of Training and Checking in Progress.** Direct observation of training and checking in progress is an effective method of evaluating training. Sometimes the opportunity for direct observation, however, will be limited. In such cases, the POI will have to rely more on his evaluation of other sources of information such as reports of surveillance and investigations. Results of inspection reports, incident or accident reports, enforcement actions, and other relevant information about the operator's performance should be reviewed by the POI for indications of training effectiveness. The POI must establish methods to evaluate these sources of information for trends which may develop while training is being conducted under initial approval. For example, repeated reports of deficiencies such as excessive taxi speed, navigation deviations, incomplete briefings, or incorrect use of the checklists, may be traceable to a lack of specific training or ineffective training. Such information may provide indications that revisions or refinements are needed for a curriculum segment and/or training modules.

**Table 4.21.2.1. Elements for Training Evaluation**

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ELEMENTS AVAILABLE FOR EVALUATING TRAINING	
CURRICULUM SEGMENT OUTLINES	Curriculum segment outlines contain the specific training modules and the amount of time allocated for the curriculum segment. The modules must be consistent with regulatory requirements and safe operating practices. This element requires direct examination.
COURSEWARE	Courseware converts curriculum outline information into usable instructional material. Courseware must be consistent with the curriculum outline and be organized to permit effective instructional delivery. It is readily adaptable to adjustments and refinement by the operator. This element usually requires direct examination.
INSTRUCTIONAL DELIVERY METHODS AND TRAINING ENVIRONMENT	Instructional delivery methods are used to convey information to the student. Effective learning is maximized if the instructional delivery adheres to and properly uses the courseware. The training environment should be conducive to effective learning. This element requires direct observation.
TESTING AND CHECKING	Testing and checking is a method for determining whether learning has occurred. Testing and checking standards are used to determine that a desired level of knowledge and skill has been acquired. Testing and checking also measures the effectiveness of courseware and instructional delivery. This element requires direct observation. It can be supplemented by examining operator records of tests and checks.
SURVEILLANCE AND INVESTIGATION OF OPERATOR ACTIVITIES	Surveillance and investigations produce information about an operator's overall performance. A high rate of satisfactory performance usually indicates a strong, effective training program. Repeated unsatisfactory performances can often be traced to deficiencies in a training program. This element requires the examination and analysis of surveillance and investigative reports.

**4.21.2.27. METHOD FOR GRANTING FINAL APPROVAL—PHASE FIVE** This phase involves the granting of final approval of an operator's training curriculum. Based on the results of the evaluation, the POI must determine whether to grant or deny final approval of a training curriculum. This determination must be made before the expiration date of the initial approval. If the POI decides not to grant final approval, the procedures outlined in paragraph 4.21.2.37 shall be followed. If the POI decides that final approval should be granted, the following procedures apply:

**A. Programs that Contain a List of Effective Pages (LEP).** Although the method presently stated in this handbook may still be used in the approval process (that is, stamping each page),

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another procedure may also be used. Final approval of the training curriculum can be granted and documented by the POI on the LEP. This means that the POI has given final approval of every page of the operator's training curriculum, as listed on that page, but only one POI approval block must be completed and signed.

- 1) The stamped page that documents final approval of the training curriculum and/or curriculum segment shall be stamped for approval, dated, and signed by the POI. The approval stamp that appears on the page should be a facsimile of the stamp that appears in Figure 4.21.2.4.
- 2) The original curriculum and/or curriculum segment must contain the one page that documents POI approval on the LEP. The curriculum and/or curriculum segment must be transmitted to the operator with an approval letter signed by the POI in accordance with handbook guidance.

**B. Programs that do not contain a LEP.** The original and a copy of each page of the training curriculum and/or curriculum segment shall be stamped for approval, dated, and signed by the POI. The approval stamp shall appear on each page and be facsimile of the stamp that appears in Figure 4.21.2.4.

**C. Original Stamped Curriculum.** The original stamped curriculum or curriculum segment must be transmitted to the operator with an approval letter signed by the POI. This letter must specifically identify the curriculum or curriculum segment; contain a statement that final approval is granted; and provide the effective date of approval. This letter must also state that final approval shall remain in effect until otherwise notified by the POI that a revision is necessary in accordance with GACAR §§ 121.851(e) or 135.381(d), provided the operator continues to train in accordance with the approved curriculum. If the POI is authorizing a reduction in the programmed hours specified by Part 121, the letter must contain a statement concerning the basis for reduction. A copy of the stamped curriculum or curriculum segment, and a copy of the approval letter must be kept on file in the GACA office. Figures 4.21.2.5 and 4.21.2.6 are sample letters of final approval.

### 4.21.2.29. REVISIONS TO TRAINING CURRICULUMS.

**A. Final Approval of Proposed Revisions.** Revisions to initially-approved training curriculums shall be processed as described in paragraphs 4.21.2.7 through 4.21.2.25. To incorporate significant revisions into training curriculum with final approval usually requires the full

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training approval process. Final approval, however, may be directly granted to a proposed revision, if the revision involves any of the following situations:

- Correction of administrative errors such as typographical or printing errors
- A reorganization of training or any changes in the sequence of training that does not affect the quality or quantity of training
- An improvement to the quality, or an increase in the quantity, of training

**B. Probable Causes of Revisions.** Other proposed revisions, including any proposal to reduce the approved number of training hours, are subject to the training program approval process. Although each step in the process must be completed, the process may be abbreviated in proportion to the complexity and extent of the proposal. There are many factors that could require revisions to training curriculums. Such factors include the following:

- The effects and interrelationships of changes in the kind of operations
- The size and complexity of an operation
- The type of aircraft being used
- Any special authorizations through operations specifications
- A revised MEL
- Any exemptions or deviations

**4.21.2.31. WITHDRAWING APPROVAL OF TRAINING CURRICULUMS.** Before withdrawing approval of an operator's training curriculum or curriculum segment, the POI shall make reasonable efforts to convince the operator to make the necessary revisions. It is important to understand that withdrawing approval could be detrimental to the operator's business. The operator's ability to continue to hold a certificate may be in question if a new curriculum is not submitted for initial approval within a reasonable period of time. A decision to withdraw approval must be based on sound judgment and justifiable safety reasons. When sufficient reasons are established, it is mandatory for the POI to take immediate action to remove POI approval from an ineffective or noncompliant training curriculum. When an approval is withdrawn, the POI must ensure that the

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operator clearly understands that any further training conducted under an unapproved curriculum is contrary to the GACARs. Compliance enforcement action must be taken if any company employee who received unapproved training is used in GACAR Part 121 or Part 135 operations. The three methods for withdrawing approval of a training curriculum are as follows:

- Allowing an initially-approved training curriculum to expire without granting final approval (paragraph 4.21.2.33)
- Withdrawing approval of an initially-approved training curriculum before the expiration date (paragraph 4.21.2.35)
- Withdrawing approval of a training curriculum which has already received final approval (paragraph 4.21.2.37)

**4.21.2.33. EXPIRED TRAINING CURRICULUMS.** A training curriculum granted initial approval has an expiration date. Usually, this date shall not be later than 24 months after the initial approval date. If the POI does not grant final approval before the expiration date, training under that curriculum must terminate as of that date. Therefore, the POI shall not allow an initially-approved curriculum to expire due to the POI's inability to administratively grant final approval. Final approval may not be granted to an operator's training curriculum for several reasons. For example, one reason may be the operator's inability to achieve an acceptable level of training effectiveness during Phase Four of the approval process. Another example of a reason for not granting final approval is the discontinued use of the initially-approved curriculum. When the POI decides not to grant final approval before the expiration date, he must notify the operator of this decision in writing, at least 30 days before the expiration date of the initially-approved curriculum. An operator not so notified may mistakenly assume that the initial approval will continue in effect until receipt of notification of either final approval or termination. The notification letter should contain the reasons for allowing the curriculum to expire and should state that any further training under the expired curriculum will not be in compliance with regulatory requirements. A POI who fails to provide this 30-day notification should establish a new expiration date so that appropriate notification can then be given to the operator.

**4.21.2.35. WITHDRAWAL OF INITIAL APPROVAL OF TRAINING CURRICULUMS.** A POI may decide to withdraw initial approval any time during Phase Four of the approval process. This action may be necessary if the training is not in regulatory compliance, does not provide for safe operating practices, or is ineffective in meeting training objectives. An operator who has received a

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letter withdrawing approval must revise or refine the training curriculum and resubmit it for initial approval. The POI must ensure that the operator understands that it is his responsibility to correct each deficiency in the training program. The POI withdraws initial approval of training curriculums by letter. This letter must contain both a statement informing the operator that initial approval is withdrawn and the effective date of the withdrawal. This letter must include the reasons for withdrawal of approval and a precaution concerning the use of persons trained under a curriculum which is not POI-approved. A sample letter for withdrawing initial approval is provided in Figure 4.21.2.7.

**4.21.2.37. WITHDRAWAL OF FINAL APPROVAL OF TRAINING CURRICULUMS.** Each operator is responsible for ensuring that its training curriculums, once they have been granted final approval, continue to provide training in accordance with the conditions under which final approval was granted. In accordance with GACAR §§ 121.851(e) and 135.381(d), whenever the POI determines revisions to a curriculum that has been granted final approval are necessary, the operator shall, after notification, make the necessary changes to ensure the effectiveness and acceptability of its training. Such notification by the POI effectively withdraws final approval. These regulations also provide the operator with certain appeal rights. The following procedures will be applied when a decision is made to withdraw final approval of a training curriculum.

**A. Required Items of the Notification Letter.** The POI shall inform the Director, Flight Operations Division of the impending action to withdraw final approval. The POI must notify the operator in writing that revisions are required in accordance with GACAR §§ 121.851(e) or 135.381(d). See Figure 4.21.2.8 for a sample letter of a notification for withdrawing final approval. The notification letter must contain the following:

- A statement that GACA approval of the training curriculum is withdrawn
- A list of the revisions which must be made
- A brief description of the reasons necessitating the revisions
- A precautionary statement concerning the use of personnel trained under a curriculum which is not GACA-approved
- A statement that the actions specified in the letter may be appealed
- Instructions on how to make an appeal

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**B. Revisions.** If the operator chooses to revise the training program in response to the notification letter, the proposed revision will be processed in the same manner as a request for initial approval. The POI must reinitiate the Five-Phase approval process previously described.

**C. Appeal of Decision by Operator.** If an operator decides to appeal the GACA's action, it must, within 30 days after receiving notification, petition the President for reconsideration of the withdrawal of final approval in accordance with the specified procedures of GACAR Part 13. The petition must be in writing and contain a detailed explanation on why the operator believes the revisions described in the withdrawal notice are unnecessary.

**4.21.2.39. ORGANIZATION OF OFFICE TRAINING FILES.** The POI shall maintain a separate training file for each operator. Each operator's training program file will be organized and maintained to keep each major curriculum type and any revisions together. Superseded training curriculum pages must be kept on file for 2 years. All correspondence and additional relevant supporting information associated with each training curriculum will be filed with the curriculum or curriculum segment, as appropriate.

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**Figure 4.21.2.1. Letter of Initial Approval (Part 135)**

[Name]

[Address]

Dear Mr. [Insert Name]:

Initial approval is granted to [Insert Name] Airlines BE-99 Pilot in Command and Second in Command Initial Equipment Flight Training, pages 1 through 10, dated March 11, 2014. This training curriculum is initially approved in accordance with the provisions of GACAR § 135.381(a), effective March 30, 2014.

Initial approval of this training curriculum shall remain in effect until March 31, 2016, or upon the granting of final approval, whichever occurs first. [Insert Name] Airlines is requested to notify this office at least 10 days in advance of any training to be conducted under this program so that the POI may evaluate the effectiveness of the program, in accordance with GACAR § 135.381(b).

Signed:

GACA Principal Operations Inspector

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**Figure 4.21.2.2. Letter of Initial Approval (Part 121)**

[Name]

[Address]

Dear Mr. [Insert Name]:

This letter in reference to [Insert Name] Airline's B-737 Pilot in Command and Second in Command Initial Equipment Ground Training curriculum, pages 100/1 through 100/15, dated April 14, 2014. This curriculum is granted initial approval, effective April 30, 2014. The approval is contingent upon a satisfactory evaluation of your advanced systems ground trainer scheduled for April 28 and 29, 2014.

The expiration date of this initial approval is April 30, 2016. This office requests [Insert Name] Airlines provide at least 7 days advance notice of any training to be conducted under this curriculum to allow for evaluation of the training in accordance with GACAR § 121.851(b) and (c). Approval of the reduced training hours from the programmed hours required by GACAR § 121.887(b) to 75 hours is based on the improved training techniques available from your advanced systems ground trainer.

Signed:

GACA Principal Operations Inspector

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**Figure 4.21.2.3. Letter of Denial of Initial Approval**

[Name]

[Address]

Dear Mr. [Insert Name]:

This letter is in response to your request for initial approval of Revision 2 to [Insert Name] Airline's DC-9 Pilot in Command and Second in Command Recurrent Ground Training curriculum, dated August 2, 2014. Your request for initial approval for revision 2 is denied for the following reason.

A portion of your scheduled operations occurs in areas of Western Europe, which during the winter months, are subject to cold weather, snow, ice, and sleet. Your pilot workforce must have adequate training in the safe operating practices associated with a cold weather environment, to enable them to cope effectively with such hazards. Revision 2 deletes training previously given on major aspects of cold weather operations and does not provide any identifiable instruction to your crews for operating flights in such conditions. Presently there is not another course of training for [Insert Name] Airline's pilots containing adequate information on cold weather procedures.

Signed:

GACA Principal Operations Inspector

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**Figure 4.21.2.4. Final Approval Stamp**

<b>GACA FINAL APPROVAL</b>	
<b>EFFECTIVE DATE:</b>	_____
<b>PRINCIPAL NAME:</b>	_____
<b>SIGNATURE:</b>	_____

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**Figure 4.21.2.5. Letter of Final Approval (Part 121)**

[Name]

[Address]

Dear Mr. [Insert Name]:

Final approval is granted to [Insert Name] Airlines' Cabin crew member Recurrent Ground Training curriculum, for pages 1 through 5, dated May 21, 2014, and for pages 6 through 7, dated April 15, 2014.

The effective date of final approval is January 20, 2015. [Insert Name] Airlines may continue to train in accordance with this curriculum until a revision is required by the POI under GACAR § 121.851(e) or, until [Insert Name] Airlines revises the curriculum.

Approval of the reduced training hours from the programmed hours required by GACAR § 121.919(c)(2) to 8 hours is based on continued use of the Rolex II cabin mockup.

Signed:

GACA Principal Operations Inspector

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**Figure 4.21.2.6. Letter of Final Approval (Part 135)**

[Name]

[Address]

Dear Mr. [Insert Name]:

Final approval is granted to [Insert Name] Airlines, Inc. Cessna 310 Pilot in Command Upgrade Ground Training curriculum, pages 1 through 6, dated December 10, 2013.

The effective date of this final approval is December 15, 2013. [Insert Name] Airline may continue to train in accordance with this curriculum until a revision is required by POI under GACAR § 135.381(d) or, until [Insert Name] Airlines revises the curriculum.

Signed:

GACA Principal Operations Inspector

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### **Figure 4.21.2.7. Letter of Withdrawal of Initial Approval**

[Name]

[Address]

Dear Mr. [Insert Name]:

This letter notifies you that GACA initial approvals of the following training curriculum segments are withdrawn, effective April 1, 2013:

1. The emergency training segment for the DC-9 Second in Command Initial New-Hire Training curriculum, pages 9.1 through 9.3, dated 11/15/2010.
2. The emergency training segment for the DC-9 Pilot in Command Upgrade Training curriculum, pages 9.31 through 9.33, dated 6/1/2011.

The investigation of the in-flight incident that occurred on [Insert Name] Airline's Flight 943 on February 10, 2012, revealed that the flight crew did not take positive action to isolate the source of smoke caused by malfunctioning cabin light ballast. During my interview, the flight crew displayed a lack of concern about the importance of taking immediate and positive action to control in-flight fire and smoke. In addition, since this incident, Inspectors from this office have been emphasizing fire and smoke-combating procedures during oral testing of DC-9 pilots taking the above listed training. These Inspectors have observed that many of your DC-9 pilots have a serious lack of knowledge about fire and smoke control procedures and the use of fire-fighting equipment, particularly the type of extinguishers to be used in different classes of fire. We have discussed these deficiencies with your staff and they have effectively revised the Emergency Training curriculum segment for the DC-9 PIC/SIC Recurrent Training. Your staff, however, advises that they will not revise the training curriculums listed above. Therefore, GACA initial approval is withdrawn. Initial approval can be re-obtained by revising the curriculum to require detailed instruction on fire and smoke control procedures and fire-fighting equipment. It is contrary to GACAR Part 121 to use pilots who have not been trained in accordance with an approved training curriculum.

Signed:

GACA Principal Operations Inspector

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### **Figure 4.21.2.8. Letter of Withdrawal of Final Approval (Part 135)**

[Name]

[Address]

Dear Mr. [Insert Name]:

This letter notifies you that, effective April 7, 2013, final approval of your BE 99 Pilot in Command Upgrade Training curriculum, dated March 2010, is withdrawn in accordance with GACAR § 135.381(d). This course of training must be revised as discussed below if GACA initial approval is to be reissued.

The revised curriculum is required to have more detailed ground and in-flight instruction on the performance, limitations, and proper operating procedures for the NST-410 area navigation systems. During the past 2 months, three of your Cessna 500 flights failed to maintain the assigned route flight specified by the air traffic control (ATC) clearance. Two of the flights required ATC radar assistance for reestablishing ATC clearance. All three pilots involved in these deviations were recently upgraded to pilots in command by completing the aforementioned training curriculum. The GACA has determined, through interviews with these pilots, that the training being given does not provide sufficient knowledge for the proper operation of the NST-410 area navigation systems.

You may file a petition for reconsideration of this withdrawal of final approval in accordance with the specified requirements of GACAR Part 13. Your petition should contain a complete explanation of why you believe final approval of the Cessna 500 Pilot in Command Upgrade Training curriculum should not be withdrawn. It is contrary to Part 135 to use pilots who have not been trained in accordance with a GACA-approved training curriculum.

Signed:

GACA Principal Operations Inspector

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 3. Flight Crew Basic Indoctrination Curriculum Segments**

**4.21.3.1. GENERAL.** This section specifies the objectives and content of basic indoctrination curriculum segments. This training is required for all flight crew members that are enrolled in an initial new-hire category of training. Basic indoctrination is normally the first curriculum segment of instruction conducted for newly hired flight crew members. It serves as the initial introduction for the new-hire employee to the operator and, in many cases, to the operational requirements of General Authority of Civil Aviation Regulation (GACAR) Part 121 and/or Part 135.

**4.21.3.3. OBJECTIVE OF BASIC INDOCTRINATION.** The objective of basic indoctrination training is to introduce the new-hire flight crew member to the operator and its manner of conducting commercial air operations. It specifically acquaints the student with the operator's policies, procedures, forms, organizational and administrative practices, and ensures the student has acquired basic airman knowledge. The flight crew member basic indoctrination curriculum segment consists of training modules which contain information applicable to the student's specific duty position. Two general subject areas are required during basic indoctrination training. These subject areas are "operator-specific" and "airman-specific" training. These two areas serve to acquaint the student with the operator's means of regulatory compliance and to ensure that the student has acquired basic knowledge before entering aircraft ground and flight training. These two areas are not always mutually exclusive and in many cases may be covered in the same training module.

##### **4.21.3.5. OPERATOR-SPECIFIC INDOCTRINATION TRAINING.**

**A. Operator-Specific.** The first subject area, "operator-specific," must include training modules in at least the following:

- Duties and responsibilities of flight crew members
- Appropriate provisions of the regulations
- Contents of the operator's operating certificate and operations specifications (OpSpecs)

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**B. Supplemental Information.** Operator-specific training modules should also include information about the company which the student needs in order to properly perform his duties as an employee of the operator. This information may include such items as the operator's history, organization, policies, scope of operation, administrative procedures, employee rules of conduct, compensation, benefits, and contracts.

### 4.21.3.7. AIRMAN-SPECIFIC INDOCTRINATION TRAINING.

**A. Airman-Specific.** The second subject area, "airman-specific," must address appropriate portions of the operator's operating manual. Airman-specific training should also include other pertinent information that ensures the student will be prepared for aircraft ground and flight training. Airman-specific indoctrination training should include elements which show that training applicable to the duty position will be given on the general principles and concepts of the following:

- Operational control (This includes dispatch or flight release, (as applicable) for Part 121 operators and flight locating procedures for Part 135 operators)
- Mass and balance (M&B)
- Aircraft performance and aerodrome analysis
- Meteorology
- Navigation
- Airspace and air traffic control (ATC) procedures
- En route and terminal area charting and flight planning
- Instrument procedures
- Crew Member Emergency Training
- Normal and Emergency Communication Procedures

**B. Parts 121 and 135.** Airman-specific indoctrination training should address the kind of

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operation and the general capabilities of the operator's aircraft. For example, a Part 121 operator using transport category turbojet aircraft should include high altitude meteorological information (e.g. the jetstream) in the meteorology training module. A Part 135 operator, using single-engine reciprocating-powered aircraft, will not normally need to address high altitude meteorology in this module. It is important to note that airman-specific training is not "aircraft-specific" and is intended to ensure the student has a fundamental understanding of certain generalized areas before progressing into aircraft ground and flight training for a specific aircraft.

**C. Runway Safety Training.** Training in runway safety and the standard operating procedures (SOPs) contained in the (as amended) editions of FAA AC 120-74, AC 91-73, and AC 120-35, Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation, should be incorporated in ground training and flight training conducted by air operators under Parts 121 and 135.

### **4.21.3.9. FLIGHT CREW BASIC INDOCTRINATION TRAINING MODULES.**

**A. Training Modules.** The flight crew member basic indoctrination curriculum segments must include as many training modules as necessary to ensure appropriate training. Each module outline must provide at least the following:

- A descriptive title of the training module
- A list of the related module elements to be presented during instruction on that module

**B. Training Module Outlines.** The training module outlines must contain sufficient elements to ensure a student will receive training in both operator-specific and airman-specific subject areas to provide a suitable foundation for subsequent "aircraft-specific" curriculum segments. An operator has a certain amount of flexibility in the construction of these training modules. For example, the airman-specific training modules for crew members with significant experience in GACAR Part 121 or 135 operations may be less comprehensive than the training modules for crew members without that experience. This is usually the case during acquisitions, mergers, or with operators who hire only highly qualified personnel with experience in Part 121 or 135 operations.

**C. Training Module Sample.** Table 4.21.3.1 illustrates one of the many acceptable methods in which a basic indoctrination training module could be presented:

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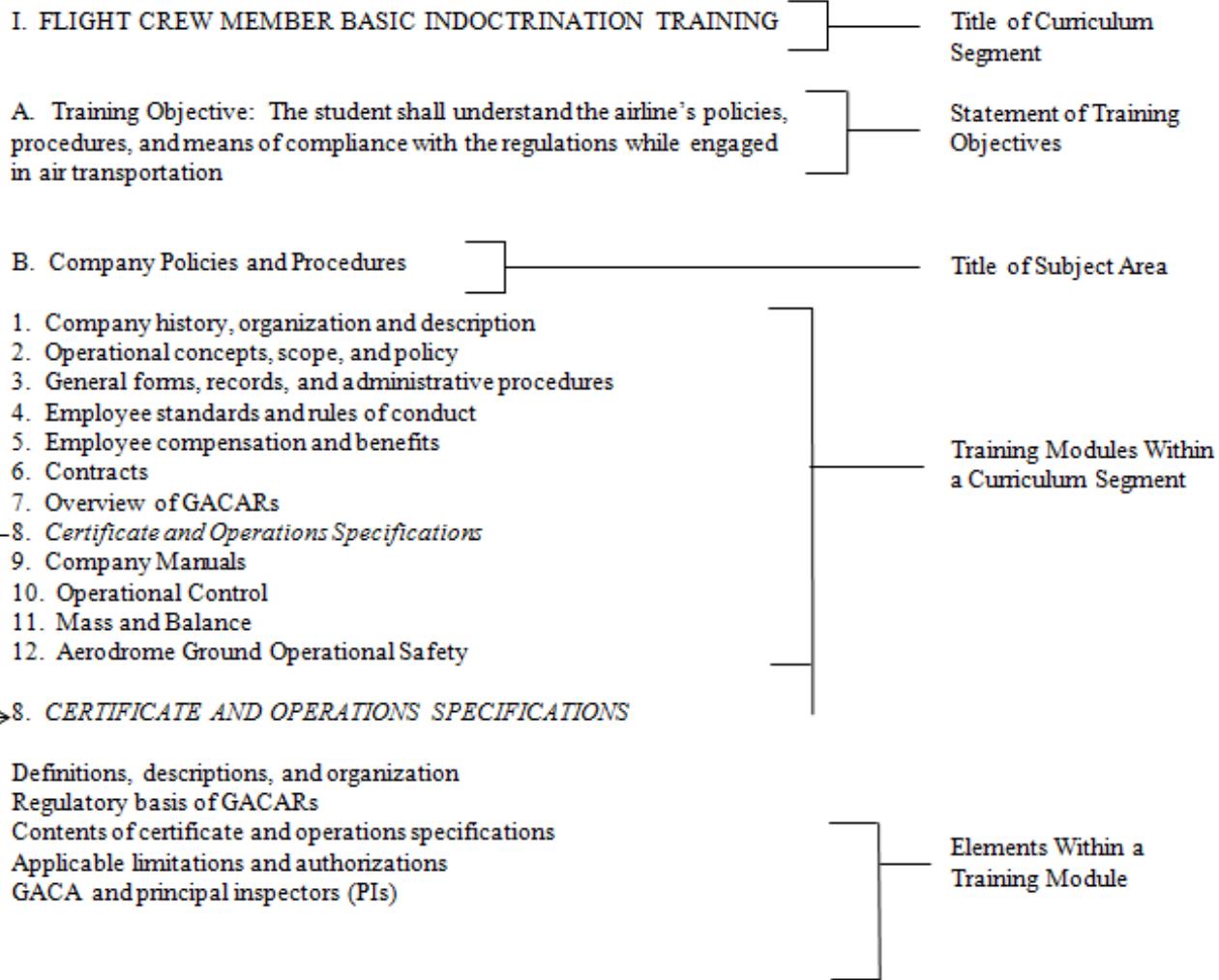
**Table 4.21.3.1. Certificate and Operations Specifications**

(a) Definitions, descriptions, and organization	Elements Within a Training Module
(b) Regulatory basis in the GACARs and in the creation of the GACA	
(c) Content of certificate and operations specifications	
(d) Applicable limitations and authorizations	

**D. Outlines.** It is not necessary or desirable to include detailed descriptions of each element within a training module outline. Such detailed descriptions are more appropriate when included in the operator's courseware such as lesson plans. During the approval process, principal operations inspectors (POIs) should review lesson plans as necessary to ensure the scope and depth of the courseware is adequate. Table 4.21.3.2 illustrates the interrelationship of training modules in the flight crew member basic indoctrination curriculum segment:

**Table 4.21.3.2. Flight Crew Member Basic Indoctrination Training**

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### 4.21.3.11. TRAINING HOURS.

**A. Part 121 Program Hours.** GACAR § 121.879 specifies a minimum of 40 programmed hours of instruction for basic indoctrination training. Normally, 40 hours should be the minimum number of training hours for basic indoctrination for GACAR Part 121 operators who employ personnel with little or no previous Part 121 experience. Reductions to the programmed hours in certain situations, however, may be appropriate for several reasons. One example would be a merger or acquisition situation where flight crew members new to the surviving operator may only require “operator-specific” training modules. Another example would be the operator’s enrollment

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prerequisites requiring a high level of Part 121 experience.

**B. Reduction in Program Hours Request.** Should an operator request a reduction in programmed hours, the POI should not approve the operator's crew member indoctrination training unless it includes at least 32 programmed hours. This minimum should be maintained even if the reduction is based upon the provisions specified in GACAR § 121.851(d).

**C. Part 135 Program Hours.** Part 135 does not specify programmed hours for flight crew member basic indoctrination training. Table 4.21.3.3 provides direction and guidance to POIs on training hours when approving basic indoctrination curriculum segments for Part 135 operators. This table provides norms. When approving these curriculum segments, POIs must consider the complexity of the operation and aircraft. For example, training hours for a complex type of operation may need to exceed the national norm, while training hours below the national norm for a less complex type of operation may be acceptable.

**Table 4.21.3.3. Part 135 - Initial New-Hire Flight crew member Basic Indoctrination Training Hours**

INITIAL NEW-HIRE FLIGHT CREW MEMBER BASIC INDOCTRINATION TRAINING HOURS	
TYPE OF OPERATION (All AIRCRAFT TYPES)	TRAINING HOURS
IFR/VFR	24
VFR ONLY	16

**4.21.3.13. COURSE COMPLETION REQUIREMENTS.** Completion of this curriculum segment must be documented by an instructor's certification that a student has successfully completed the course. This certification is usually based on the results of a written examination given at the end of the course. With some training methods, the certification may be based on student progress checks administered during the course.

**4.21.3.15. CONTENT OF FLIGHT CREW BASIC INDOCTRINATION CURRICULUM SEGMENTS.** A basic indoctrination curriculum segment should show that training will be given in at least two general subject areas appropriate to the operator's type of operation. These subject areas

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of training are “operator-specific” (see paragraph 4.21.3.17) and “airman-specific” (see paragraph 4.21.3.19).

**4.21.3.17. OPERATOR-SPECIFIC TRAINING MODULES.** The subject area of a basic indoctrination training curriculum segment referred to as “operator-specific” includes training modules that pertain to the operator’s methods of compliance with the regulations and safe operating practices. Examples of recommended training modules for the operator-specific subject area follow:

### A. Duties and Responsibilities.

- Company history, organization, and management structure
- Safety Management Systems (SMS)
- Operational concepts, policies, and kind of operation
- Company forms, records, and administrative procedures
- Employee standards and rules of conduct
- Employee compensation and benefits
- Authority and responsibilities of duty position
- Company-required equipment
- Company manual organization, revisions, and employee responsibilities concerning manuals

### B. Appropriate Provisions of the GACARS.

- Flight crew member certification, training, and qualification requirements
- Medical certificates, physical examination, and fitness for duty requirements
- Operational control requirements (dispatch, flight release, or flight locating)
- Fatigue management requirements

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- Recordkeeping requirements
- GACAR Part 5 (SMS) and Part 119 (Certification Rules)
- Operational rules in Parts 91 and 121 or 135 (as appropriate) and any other applicable regulations
- Regulatory requirements for company manuals
- Other appropriate regulations such as flight crew emergency authority, interference with crew members, and reporting requirements
- GACAR Part 7 (Problematic Use of Psychoactive Substances - Prevention and Safety Programs)
- GACAR Part 109 (Dangerous Goods)
- Applicable portions of the GACA Security Regulations
- Aviation Investigation Bureau (AIB) regulations pertaining to the notification and reporting of aircraft accidents or incidents and overdue aircraft, and preservation of aircraft wreckage, mail, cargo, and records

### C. Contents of Certificate and OpSpecs.

- Regulatory basis in Parts 119, 121 or 135 (as applicable)
- Definitions, description, and organization of operations specifications (OpSpecs)
- Limitations and authorizations of OpSpecs
- Description of certificate
- Description of General Authority of Civil Aviation (GACA), Safety & Economic Regulation (S&ER) including the responsibilities of the Director of Flight Operations (DFO), Principal Inspectors (PIs) and Inspectors

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**4.21.3.19. AIRMAN-SPECIFIC TRAINING MODULES.** The “airman-specific” training modules of the basic indoctrination curriculum segment contain training to ensure a student will be able to enter subsequent ground and flight training curriculum segments. These modules address the appropriate portions of the operator’s manual and standard practices of airmanship and flight procedures in other documents. The emphasis in airman-specific training is not aircraft-specific. It should relate to the operator’s kind of operation and the family or families of aircraft used by the operator. The objective of airman-specific training is to ensure the student has acquired the basic knowledge necessary for Part 121 or 135 operations (as applicable). Examples of recommended training modules for the airman-specific subject area follow:

### **A. Company Operational Control.**

- Dispatch, flight release, or flight locating systems and procedures (as applicable)
- Organization, duties, and responsibilities
- Weather and Notices to Airmen (NOTAM) information
- Company communications

### **B. Mass and Balance (M&B).**

- Definitions (such as zero-fuel mass, moments, and datum)
- General loading procedures and center of gravity computations
- Effects of fuel burn and load shifts in flight
- M&B forms, load manifests, fuel slips, and other applicable documents

### **C. Aircraft Performance and Aerodrome Analysis.**

- Definitions (such as balanced field, visual meteorological conditions (VMC), obstruction planes, and maximum endurance)
- Effects of temperature and pressure altitude
- Instrument Procedures design criteria (obstacle clearance standards) – (ICAO PANS-OPS)

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- Aerodrome analysis system as appropriate to the type of operation and family or families of aircraft
- Effects of contaminated runways

### **D. Meteorology.**

- Basic weather definitions (such as forecasts, reports, and symbols)
- Temperature, pressure, and winds
- Atmosphere moisture and clouds
- Air masses and fronts
- Thunderstorms, icing, sand storms, and wind shear

### **E. Navigation.**

- Definitions
- Basic navigational instruments
- Navigational Aids (NAVAID)
- Performance-based navigation (PBN) concepts

### **F. Airspace and ATC Procedures.**

- Definitions (such as precision approaches, airways, and automated terminal information service (ATIS))
- Description of airspace
- Navigation performance and separation standards
- Controller and pilot responsibilities

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- ATS communications
- Air traffic flow control
- Wake turbulence recognition and avoidance

### **G. En Route and Terminal Area Charting and Flight Planning.**

- Terminology of charting services
- Takeoff minimums, landing minimums, and alternate requirements
- General company flight planning procedures
- Flight service and international procedures (as applicable)
- Aerodrome diagrams
- Aerodrome Ground Operational Safety

### **H. Concepts of Instrument Procedures.**

- Definitions (such as minimum descent altitude (MDA), height above aerodrome (HAA), height above touchdown (HAT), decision height (DH), Category II (CAT II) instrument landing system (ILS), and no procedure turn required (NOPT))
- Holding patterns, procedure turns
- Precision approaches (such as Category I (CAT I), LTS CAT I, CAT II, OTS CAT II and Category III (CAT III))
- Non-precision approaches
- APV approaches
- Stabilized approaches and the CDFA technique

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- Circling and visual approaches

### **4.21.3.21. EVALUATION OF FLIGHT CREW BASIC INDOCTRINATION CURRICULUM**

**SEGMENT OUTLINES FOR INITIAL APPROVAL.** When evaluating a basic indoctrination curriculum segment, Inspectors must determine that the operator-specific and airman-specific subject areas are properly addressed. Operation-specific and airman-specific elements may be outlined in the same training module. Inspectors must determine that basic indoctrination curriculum segments meet the following two requirements:

**A. Review Criteria for Operator-Specific Training.** The operator-specific training must contain information of sufficient quality, scope, and depth to ensure the crew member fully understands the duties and responsibilities applicable to the duty position. Training modules must also provide enough information to acquaint the student with the operator's policies, procedures, and practices.

**B. Review Criteria for Airman-Specific Training.** Airman-specific modules must address appropriate portions of the operator's operating manual and other pertinent information. These modules should contain elements which address the operator's type of operation and certain generalized areas, such as meteorology and the principles of mass and balance. It is essential that the Inspectors and operators understand that airman-specific training is not aircraft-specific training. Airman-specific training is intended to ensure that students have acquired fundamental aviation concepts before progressing into ground and flight training for a specific aircraft.

### **4.21.3.23. FLIGHT CREW MEMBER BASIC INDOCTRINATION CURRICULUM SEGMENT JOB AID.**

**A. Overview.** The basic indoctrination curriculum segment job aid (Tables 4.21.3.4 and 4.21.3.5) is provided to assist the Inspector when evaluating this curriculum segment outline. This job aid is provided for guidance only and must not be construed as containing mandatory or regulatory requirements. This job aid focuses on the two subject areas of this curriculum segment (operator-specific and airman-specific training). It serves as an aid for Inspectors when evaluating individual training modules.

**B. Job Aid/Operator's Proposal Comparison.** When using the job aid, Inspectors should make a side-by-side comparison of the operator's proposal to make the following determinations:

- The proposal provides for operator-specific and airman-specific instruction

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- The proposal is generalized in nature, and serves to acquaint the student with the operator's procedures, policies, and practices
- Normally, training modules should not contain elements which are "aircraft-specific"
- Sufficient training module elements should be listed to ensure the appropriate depth and scope of the material will be presented

**C.** The job aid is organized with training subjects listed in the left column and evaluation criteria or remarks listed horizontally across the top. Inspectors may use the spaces within the matrix for items such as notes, comments, dates, or checkmarks. There are also blank columns and rows in each job aid which permit Inspectors to include additional training modules or evaluation criteria.

**4.21.3.25. PSYCHOACTIVE SUBSTANCE TESTING.** All operators should include the requirements of GACAR Part 7 and GACAR § 91.21(c) in the operator training program as a module in Basic Indoctrination and Recurrent Training Curricula Segments.

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Table 4.21.3.4. Flight Crew Basic Indoctrination Training Job Aid - Subject Area 1: Operator-Specific Training

TRAINING SUBJECTS	EVALUATION CRITERIA			
	ADEQUACY OF ELEMENTS/ EVENTS	ADEQUACY OF COURSEWARE TRAINING	AIDS AND FACILITIES	REMARKS
Company History, Organization, and Description				
Operational Concepts, Scope, and Policy				
General Forms, Records, and Administrative Procedures				
Employee Standards and Rules of Conduct, including psychoactive substance training				
Employee Compensation and Benefits				
Overview of the GACARs				
Certificate and Operations Specifications				
Company Manuals				
Flight Control				
Mass and Balance				
Aerodrome Ground Operational Safety				

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Table 4.21.3.5. Flight Crew Basic Indoctrination Training Job Aid—Subject Area 2: Airman-Specific Training

TRAINING SUBJECTS	EVALUATION CRITERIA			
	ADEQUACY OF ELEMENTS/ EVENTS	ADEQUACY OF COURSEWARE TRAINING	AIDS AND FACILITIES	REMARKS
Principles of Mass and Balance				
Performance and Aerodrome Analysis				
Principles of Meteorology				
Principles of Navigation				
Airspace and ATC Procedures				
En Route/Terminal Charting and Flight Planning				
Instrument Procedures				

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 4. Flight Crew General Emergency Training Curriculum Segments**

**4.21.4.1. GENERAL.** There are two types of emergency training that General Authority of Civil Aviation (GACAR) Part 121 and 135 operators must provide to flight crew members. One type is “aircraft-specific.” This type of emergency training includes instruction and practice in emergency and abnormal procedures associated with aircraft systems, structural design, and operational characteristics. This training provides pilots and flight engineers with the knowledge and skills necessary to perform the emergency or abnormal procedures specified in the approved Aircraft Flight Manual (AFM) or those AFM procedures incorporated in the operator’s aircraft operating manual. Examples of such procedures are those used when engine, landing gear, flight control, and/or pressurization problems occur. “Aircraft-specific” also includes training on the location of specific items of emergency equipment on the aircraft, such as fire extinguishers, oxygen bottles, life rafts, life vests, and first aid kits. Aircraft specific training must be included in the aircraft ground and flight training curriculum segments as described in Sections 5 and Section 6 of this chapter. The other type of emergency training is referred to as “general emergency training.” General emergency training is required for crew members on each item specified in GACAR §§ 121.907 and 135.389. This section provides direction and guidance on the content, methods of presentation, evaluation, and approval of flight crew general emergency training.

A. Two distinct subject areas of training are required in the conduct of general emergency training. These areas of training are “emergency drill” training and “emergency situation” training.

- 1) The general emergency training curriculum segment must contain training modules that provide for training in both subject areas.

**NOTE:** “Emergency Drill” training provides instruction and practice in the actual use of certain items of emergency equipment, such as fire extinguishers, life vests, oxygen bottles, and first aid equipment.

**NOTE:** The discharge of Halon extinguishing agents during firefighting drills is not

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appropriate unless a training facility is used that is specifically designed to prevent harm to the environment from the discharged Halon. When such facilities are not used, other fire extinguishing agents that are not damaging to the environment should be used during the drills.

2) “Emergency Situation” training consists of instruction on the factors involved, as well as the procedures to be followed, when emergency situations occur. Examples include passenger evacuations, ditching, rapid decompressions, aircraft fires, and persons needing first aid.

**B.** The training modules for general emergency training must address the type of operation performed by an operator. For example, if a company operates aircraft above 25,000 feet (7620 m), crew members must receive instruction in subjects such as respiration, hypoxia, decompression sickness, and any related procedures. As another example, a company that does not conduct extended overwater operations does not need to conduct training in the use of life rafts.

### **4.21.4.3. JOINT PILOT/CABIN CREW MEMBER EVACUATION TRAINING.**

#### **A. Background.**

1) During a study, the United States (US) National Transportation Safety Board (NTSB) asked flight crews who had participated in real, actual evacuations that received detailed investigations what changes could be implemented to improve emergency evacuation of passengers. Four flight crew members mentioned joint training with cabin crew members. In addition, two cabin crew members recommended joint training with the flight crew on evacuation procedures. Although many crew members had participated in joint Crew Resource Management (CRM) training, a much smaller percentage indicated that it included joint evacuation drills. The NTSB recommended joint evacuation and/or wet ditching drill training and joint CRM training that included group exercises to improve crew member communication and coordination.

2) The President agrees with the intent of this study and recommends that operators incorporate the information found in Federal Aviation Administration (FAA) Advisory Circular (AC) 120 51E (as amended), Crew Resource Management Training which states that cabin crew members should conduct CRM training with flight crews covering shared issues such as evacuations and ditching. In addition, the President has determined that it would be beneficial to safety if principal operations inspectors (POIs) ensure that their assigned

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operators are aware of the performance benefits that result when flight crews and cabin crew members perform emergency evacuation and ditching drills together.

**B. Policy.** Giving crew members the opportunity to experience crew coordination and teamwork during required training drills is highly desirable. This is not always possible because of the difference in the numbers, the training schedules, and the training facilities of cabin crew members and flight crew members. Regardless of these challenges, operators have used a variety of methods to ensure that crew members understand the procedures and actions of other crew members during emergency situations. These methods have included the use of videos that show the procedures for both flight crew and cabin crew members during a simulated emergency situation and the timeframes required to complete those procedures. The simulation is especially helpful when followed by a discussion in which crew members are encouraged to discuss the role of fellow crew members.

- 1) The President recognizes the value of all activities that encourage communication and coordination between crew members. This would include joint CRM training, joint evacuation training, schedules that allow pilots and cabin crew members to remain together as a crew for the duration of their trip sequence, preflight briefings that occur between the captain and the cabin crew member crew, and coordination between flight crew and cabin crew member training departments to ensure standardization of procedures.
- 2) POIs and Cabin Safety Inspectors (CSIs) (if applicable) should ensure that their assigned operators are aware of the desirability of flight crew and cabin crew members performing emergency evacuation and ditching drills together. Further, they should ensure that when this is not possible, operators are aware of the desirability of training programs that include information addressing the roles of other crew members during emergency evacuations and ditching exercises.

### 4.21.4.5. GENERAL EMERGENCY TRAINING CURRICULUM SEGMENTS.

**A. Part 121.** All GACAR Part 121 operators must develop and obtain approval of a general emergency training curriculum segment for the initial new-hire category of training. GACAR Part 121 operators using aircraft from more than one group (i.e. turbopropeller powered airplanes, turbojet powered airplanes, or rotorcraft) must develop a general emergency training curriculum segment for flight crew members required to receive initial equipment training on an aircraft in one of those different groups of aircraft for the first time. Part 121 operators may elect (or POIs

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may require them) to develop a separate general emergency training curriculum segment for flight crew members required to receive initial equipment training on an aircraft in the same group. In this situation, the decision to develop a separate general emergency training curriculum segment should be based on the complexity of the operation, the extent of the differences in the flight regimes of the aircraft involved, and the extent of differences in the emergency equipment and procedures associated with the aircraft involved.

**B. Part 135.** All GACAR Part 135 operators must develop and obtain approval of a general emergency training curriculum segment for the initial new-hire category of training. GACAR Part 135 operators may elect (or POIs may require them) to develop a separate general emergency curriculum segment for flight crew members required to receive the initial equipment category of training. In this situation, the decision to develop a separate general emergency training curriculum segment should be based on the complexity of the operation, the extent of the differences in the flight regimes of the aircraft involved, and the extent of differences in the emergency equipment and procedures associated with the aircraft involved. For example, an operator who operates both reciprocating-powered and turbojet-powered aircraft may need to develop separate general emergency training curriculum segments for incorporation into the initial equipment category of training appropriate for these types of aircraft.

**C. Transition and Upgrade Training - Parts 121and 135.** There is not a requirement for a separate general emergency curriculum segment for the transition and upgrade categories of training. For these categories of training, flight crew members will have previously received the appropriate general emergency training during initial new-hire training or, when appropriate, initial equipment training. Aircraft-specific emergency training must be included in the transition or upgrade aircraft ground and flight training curriculum segments.

**D. Recurrent Training - Parts 121 and 135.** GACAR Part 121 and 135 operators must develop and obtain approval of a separate general emergency training curriculum segment for the recurrent category of training. Usually, it will be appropriate to have two general emergency curriculum segments, one that reflects a 12-month cycle of emergency situation training and another that reflects a 24-month cycle of emergency drill (actual hands-on) training (see paragraph 4.21.4.7, below). However, it is acceptable to incorporate the emergency drill “hands-on” training into a single curriculum segment provided it clearly requires that flight crew members receive the emergency drill (hands-on) training at least once each 24 months.

**E. Requalification Training - Parts 121 and 135.** Whether a general emergency curriculum

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segment is required for the requalification category of training is dependent on the purpose of the requalification training. In general, if the purpose of the requalification training is to re-qualify flight crew members that have been unqualified for more than one year, a general emergency training curriculum segment should be required.

**4.21.4.7. RECURRENT GENERAL EMERGENCY TRAINING.** GACAR Part 121 and 135 operators are required to conduct recurrent general emergency training. This curriculum segment is separate from the aircraft ground recurrent training curriculum segment. Recurrent general emergency training consists of “emergency situation” and “emergency drill” training modules.

**A.** Recurrent general emergency training for GACAR Part 121 and 135 operators consists of all the items contained in GACAR §§ 121.907 and 135.389, as applicable. This training must be conducted every 12 months, usually at the same time that aircraft ground recurrent training is conducted.

**B.** The emergency situation training modules that are part of the recurrent general emergency training curriculum segment must include at least the following:

- Rapid decompression (if applicable)
- In-flight fire (or on-the-surface) and smoke control procedures
- Ditching and evacuation situations
- Illness, injury, the proper use of medical equipment, and other abnormal situations involving passengers or crew members

**C.** The emergency drill training modules, which require the crew member to actually operate the items of emergency equipment (hands-on), must be conducted at least every 24 months. During the alternate 12-month periods, the emergency drill training may be accomplished by pictorial presentation or demonstration. The emergency drill training modules that are part of the recurrent general emergency training curriculum segment must include at least the following:

- Operation of emergency exits (such as floor level, overwing, and tail cone) in the normal and emergency modes
- Operation of each type of hand held fire extinguisher

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- Operation of each type of emergency oxygen system
- Donning, use, and inflation of life preservers and other flotation devices (if applicable)
- Ditching procedures (if applicable), including cockpit preparation, crew coordination, passenger briefing, cabin preparation, the use of life lines, and boarding of passengers and crew into a life raft or slide raft, as appropriate

**D.** Table 4.21.4.1 serves to clarify the chronological order of recurrent general emergency training requirements:

**Table 4.21.4.1. Chronological Order of Recurrent General Emergency Training Requirements.**

<b>TYPE OF RECURRENT GENERAL EMERGENCY TRAINING REQUIRED</b>	<b>MONTHS SINCE FIRST EMERGENCY TRAINING CURRICULUM SEGMENT WAS COMPLETED</b>			
	<b>12 MONTHS</b>	<b>24 MONTHS</b>	<b>36 MONTHS</b>	<b>48 MONTHS</b>
Emergency Situation Training	X	X	X	X
Emergency Drill (either hands-on or pictorial presentation/demo)	X	X	X	X
Emergency Drill (hands-on required)		X		X

### **4.21.4.9. GENERAL EMERGENCY TRAINING MODULES.**

**A.** A general emergency training curriculum segment must include as many training modules as necessary to ensure appropriate training. Each module outline must provide at least:

- A descriptive title of the training module
- A list of the related elements or events that will be presented during instruction on the module

**B.** The training module outline must contain sufficient elements or events to ensure that a student

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will receive training on the emergency equipment and procedures common to all of the operator's aircraft and the type of operation being conducted.

**C.** It is unnecessary to include detailed descriptions of each element within a training module outline. Such detailed descriptions are appropriate when included in the operator's courseware, such as lesson plans. During the approval process, the POI should review courseware as necessary to ensure that the scope and depth of the training modules are adequate. Table 4.21.4.2 is an example of an acceptable method of presenting a general emergency training module outline:

**Table 4.21.4.2. An Acceptable Method of Presenting a General Emergency Training Module Outline**

### 3. AIRCRAFT FIRES

- a. Principles of combustion and classes of fires
- b. Toxic fumes and chemical irritants
- c. Use of Halon, CO<sub>2</sub>, and water extinguishers
- d. Lavatory fires
- e. Smoke masks and goggles

**NOTE:** In the preceding illustration, such items as engine fire procedures, electrical fire procedures, and the location of each fire extinguisher are intentionally not included. These elements or events are included in the aircraft ground and flight training curriculum segments.

**D.** Table 4.21.4.3 illustrates the interrelationship of training modules in the flight crew member general emergency training curriculum segment:

**Table 4.21.4.3. The Interrelationship of Training Modules in the Flight Crew member General Emergency Training Curriculum Segment**

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 IV. FLIGHT CREW MEMBER GENERAL EMERGENCY  
 TRAINING CURRICULUM SEGMENT

A. Training Objective:

Title of Curriculum

B. Emergency Situation Training:

 Statement of Training Objectives  
 Title of Subject Area

1. Crew member Duties and Responsibilities
2. Crew member Coordination and Company Communication
3. Aircraft Fires
4. Medical Equipment
5. Illness, Injury, and Basic First Aid
6. Ground Evacuation
7. Ditching
8. *Rapid Decompression*
9. Previous Aircraft Accidents/Incidents
10. Crew Member Incapacitation
11. Basic Survival Training

Training Modules Within a Curriculum Segment

 → 8. *Rapid Decompression*

- (a) Respiration
- (b) Hypoxia, Hypothermia, and Hyperventilation
- (c) Time of Useful Consciousness
- (d) Gas Expansion/Bubble Formation
- (e) Physical Phenomena and Actual Incidents

Elements Within a Training Module

**4.21.4.11. TRAINING HOURS.** A minimum number of training hours for general emergency training curriculum segments is not specified in GACAR Part 121 and 135. When approving these curriculum segments, the POI must consider the complexity of the type of operation and the complexity of the aircraft used. When approving general emergency training curriculum segments, POIs should use Table 4.21.4.4, as a guide. The table includes a list of norms for the initial new-hire general emergency training hours. The training hours for a complex type of operation may need to exceed the recommended norm while training hours below the norm may be acceptable for a less complex type of operation. Norms have not been established for initial equipment or recurrent general emergency

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training.

**Table 4.21.4.4. Initial New Hire Flight Crew Member General Emergency Training Hours**

AIRCRAFT FAMILY	TYPE OF OPERATION	TRAINING HOURS
Transport Category Aircraft, Commuter Category Airplanes, Turbojets	All	8
Turbopropeller-Powered Small Airplanes		
Multi-Engine Reciprocating- Powered Airplanes	Land Operations	4
	Extended Overwater	6
	Remote Regions	6
Single-Engine Reciprocating- Powered Airplanes	Lands Operations	2
	Extended Overwater	4
	Remote Regions	6
Non-Transport Category Rotorcraft	Land Operations	4
	Extended Overwater	6
	Remote Regions	6

**4.21.4.13. COURSE COMPLETION REQUIREMENTS.** Completion of the curriculum segment must be documented by an instructor's or supervisor's certification that the student has successfully completed the course. The certification is usually based on the results of a written examination given at the end of the course. With some training methods, the certification may be based on student progress checks administered during the course.

**4.21.4.15. CONTENT OF FLIGHT CREW MEMBER GENERAL EMERGENCY TRAINING CURRICULUM SEGMENTS.** A general emergency training curriculum segment must indicate that training will be given, appropriate to the operator's type of operation, in two distinct areas. These areas of training are "emergency situation" and "emergency drill."

**4.21.4.17. EMERGENCY SITUATION TRAINING MODULES.** Emergency situation training modules provide instruction, demonstration, and practice in the handling of emergency situations. The following are examples of recommended training modules for the emergency situation subject area:

**A. Flight Crew member Duties and Responsibilities.**

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- Emergency assignments
- Captain's emergency authority
- Reporting incidents and accidents

### **B. Crew Coordination and Company Communication.**

- Cabin Crew notification procedures
- Ground agency notification procedures (Aviation Investigation Bureau (AIB), Aerodrome Authority)
- Company communication procedures

### **C. Aircraft Fires.**

- Principles of combustion and classes of fire
- Toxic fumes and chemical irritants
- Use of appropriate hand-held extinguishers
- Lavatory fires
- Smoke masks and goggles

### **D. Medical Equipment.**

- Contents of first aid kit, universal precaution kit, medical kit
- Requirements for first aid kit integrity
- Automated external defibrillators
- Use of individual items

### **E. Illness, Injury and Basic First Aid.**

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- Principles of cardiopulmonary resuscitation (CPR)
- Ear and sinus blocks
- Seeking medical assistance
- Treatment of shock
- Heart attack and pregnancy situations

### **F. Ground Evacuation.**

- Aircraft configuration
- Directing passenger flow
- Blocked or jammed exit procedures
- Fuel spills and other ground hazards
- Handicapped persons

### **G. Ditching.**

- Cockpit and cabin preparation
- Passenger briefing
- Crew coordination
- Primary swells, secondary swells, and sea conditions
- Ditching heading and water landings
- Ditching at night

### **H. Rapid Decompression.**

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- Respiration
- Hypoxia, hypothermia, hyperventilation
- Time of useful consciousness
- Gas expansion/bubble formation
- Physical phenomena and actual incidents

### I. Previous Aircraft Accidents/Incidents.

- Accident report reviews
- Human factors/considerations.

### J. Crew Member Incapacitation.

- Company procedures
- AIB reporting requirements
- Interference with crew members

### K. Hijacking and Other Unusual Situations.

- Hijack procedures
- Bomb threat procedures
- Security coordinator responsibilities
- In-flight intercept signals and procedures

#### 4.21.4.19. SITUATIONS REQUIRING EMERGENCY EVACUATIONS.

##### A. Background.

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1) Studies have been conducted by safety organizations to determine what situations would cause a flight crew to require an emergency evacuation, according to their company procedures. The most frequent event leading to an evacuation was an engine fire, accounting for 18 of the 46 evacuations (39 percent). At some operators, checklist procedures direct the flight crew to initiate or consider ground evacuation procedures for emergency landing, fire (engine, auxiliary power unit (APU), avionics, and cargo), smoke (in cabin equipment, in air conditioning, and smoke removal), abnormal landing gear, ditching, and aircraft sabotage. However, other operators direct flight crews to initiate or consider evacuation only for gear-up landings, ditching, or forced landings.

2) Based on this information, the studies concluded that pilots are not receiving consistent guidance, particularly in flight operations and safety manuals, on when to evacuate an aircraft. Based on the findings the POIs should require flight operations manuals and safety manuals to include in abnormal and emergency procedures checklists, a checklist item that directs flight crews to initiate or consider emergency evacuation in all emergencies that could reasonably require an aircraft evacuation (for example, a cabin fire or an engine fire).

**B. Policy.** Operators should evaluate the guidance and training that is given to their flight crews regarding a crew's decision to initiate or consider an emergency evacuation and ensure that it addresses the majority of situations for which an emergency evacuation may be warranted, including smoke or fire in the cabin. In addition, each air operator should consider a checklist item that directs flight crews to initiate or consider an emergency evacuation in all emergencies that could reasonably require an evacuation.

**4.21.4.21. EMERGENCY DRILL TRAINING MODULES.** The area of a general emergency training curriculum segment referred to as emergency drill training provides instruction, demonstration, and practice in the actual operation of certain items of emergency equipment. Examples of recommended training modules for the emergency drill training subject area are as follows:

### A. Hand-Held Fire Extinguishers.

- Inspection tags, dates, and proper charge levels
- Removal and stowage of extinguishers
- Actual discharge of each type of extinguisher,

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- Maintenance procedures and minimum equipment list (MEL)

### **B. Portable Oxygen Systems.**

- Inspection tags, dates, and pressures
- Removal and stowage of oxygen bottles
- Actual operation of each type of bottle and each type of mask

### **C. Emergency Exits and Slides.**

- Actual operation (open and close) of each exit in the normal and emergency modes
- Instruction on slide or slide raft deployment, transfer from one door to another, and detachment from the aircraft or training device of each type of slide or slide raft (if applicable)
- Actual use of slide or slide raft (this requirement needs to be accomplished only once during initial new-hire or initial equipment training)

### **D. Ditching Equipment (if applicable).**

- Actual donning, use, and inflation of individual flotation means (life preservers)
- Instruction on life raft removal from the aircraft and inflation of each type of life raft
- Instruction on the use of life lines
- Actual boarding of a life raft or slide raft
- Instruction on survival equipment

#### **4.21.4.23. PLANNED EMERGENCY BRIEFINGS.**

**A. Background.** During a study, the United States (US) National Transportation Safety Board (NTSB) reviewed both planned and unplanned evacuations. The majority of cases (31) in the study were reported to be unplanned evacuations and 14 were carried out following crew planning for a possible evacuation. For the planned evacuations, the amount of planning varied

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from case to case. Prior to landing in an Airbus A-320 that had an unsafe nose gear, the cabin crew members completed a comprehensive preparation for landing that included relocating the passengers and a detailed passenger briefing to prepare them for the evacuation. No passengers received injuries during the successful evacuation. In another case, passengers were informed that a maintenance problem had occurred and the airplane would be returning to the aerodrome. Cabin crew members calmed and reassured the passengers but did not prepare the cabin for an emergency evacuation. In this case, 11 passengers sustained minor injuries.

- 1) Planning for evacuations involves more than just keeping passengers calm. Reviewing brace positions improves the chance that passengers will be properly braced for the emergency landing. Planned evacuations also allow the cabin crew members to inform the passengers of what to expect, thereby avoiding surprises that could possibly delay the evacuation. For example, passengers who were flying on a Beech 1900 reported that they were surprised there were no slides at the exits.
- 2) Inadequate time to prepare, no procedures for abbreviated briefings, and lack of communication from the flight crew regarding the possibility of an evacuation prevented adequate passenger briefings in several cases studied.

**B. Policy.** Passengers who are informed and briefed regarding the possibility of an evacuation are better prepared to handle an evacuation, should one occur. Operators should ensure that they have procedures in place to encourage communication from the flight crew to the cabin crew members regarding the possibility of an evacuation. In addition, operators should have procedures in place to ensure that passengers are provided with precautionary briefings when flight crews anticipate an eventual evacuation.

- 1) Further, operators should develop procedures that are designed to accommodate abbreviated timeframes for cabin preparation for a planned evacuation or ditching. They should establish guidance and procedures for their cabin crew members that specifically address reduced timeframes for cabin preparation and give their cabin crew members the opportunity to practice these procedures during emergency training. These procedures should prioritize the cabin preparation tasks and critical elements of passenger information that can have a maximum positive effect on an evacuation and can be delivered in an abbreviated timeframe. For example, a review of the brace position and a reminder to review the safety information card for exit location and operation provides passengers with information that they can use to prepare for a safer and more efficient evacuation.

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2) There are several methods that an operator may employ to accomplish this. For example, an operator could have one announcement/checklist and structure it so that tasks are completed in order of importance. Even an abbreviated timeframe would allow the most critical tasks to be completed first. Another method could be to have two different announcements/checklists to accomplish specific timeframes such as “over 10 minutes to prepare/under 10 minutes to prepare.” Regardless of the method the operator chooses, POIs and CSIs (if applicable) should ensure that their assigned operators have procedures in place that are able to accommodate abbreviated timeframes for cabin preparation for an emergency landing.

**4.21.4.25. RECURRENT GENERAL EMERGENCY TRAINING MODULES.** Recurrent general emergency training consists of emergency situation training elements and emergency drill training events (in the form of training modules) that are selected by the operator and approved by the POI.

A. During alternate 12-month periods, when (actual hands-on) emergency drill training is not required, operators may use approved pictorial presentations or demonstrations. When approving pictorial presentations, the POI must ensure that the presentation meets the following criteria:

- 1) The equipment shown in each pictorial presentation must be functionally identical to the equipment on board the aircraft.
- 2) The pictorial display of equipment must be large enough to be properly viewed by the whole class.
- 3) All procedures must be accurately and logically presented.
- 4) All emergency equipment not actually demonstrated during the course of instruction must be presented pictorially.

B. Every 24 months each crew member must receive (actual hands-on) emergency drill training. This means that each crew member must actually perform each drill or procedure and must actually operate each piece of emergency equipment specified in paragraph 4.21.4.21. Certain hands-on emergency drill events must be conducted in a static aircraft or in an approved cabin/exit mock-up training device.

**4.21.4.27. CABIN AND EXIT MOCKUPS.** Hands-on emergency drill training for items such as emergency exits and passenger oxygen systems should be conducted in a static aircraft, in an

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approved cabin mock-up training device, or by use of an approved exit mock-up training device. Cabin and exit mock-up training devices should be representative of a full-scale section of an aircraft. Cabin mock-ups should include operational doors, window exits, slides, rafts, and other equipment used in emergency drill training. POIs should not approve cabin or exit mock-up training devices without an inspection to determine the adequacy of the devices. Generally, cabin and exit mock-up training devices are acceptable if they meet the following criteria:

- Cabin mock-ups should be representative of the operator's aircraft with appropriate equipment installed
- Cabin mock-ups should be full-scale, except for length
- The forces required to open the exit mock-ups should duplicate normal and emergency conditions with the slides or slide raft installed
- The mechanisms and instructions required to operate the exits should be representative of the operator's aircraft

### **4.21.4.29. EVALUATION OF FLIGHT CREW MEMBER GENERAL EMERGENCY**

#### **TRAINING CURRICULUM SEGMENT OUTLINES FOR INITIAL APPROVAL.**

When evaluating a general emergency training curriculum segment for initial approval, POIs must determine that the training modules contain information of sufficient quality, scope, and depth to ensure that the flight crew member can perform emergency duties and procedures without supervision. POIs should use the job aid in this section when evaluating the proposed curriculum segment outline.

### **4.21.4.31. FLIGHT CREW MEMBER GENERAL EMERGENCY TRAINING JOB AID.**

**A.** The Flight Crew Member General Emergency Training Job Aid (Figure 4.21.4.5) is provided to assist the POI when evaluating this curriculum segment. The regulatory requirements of GACAR Part 121 and 135 general emergency training are contained in this job aid. The job aid covers the two subject areas of general emergency training, "emergency situation" and "emergency drill" training, and is intended to assist the POI in evaluating individual training modules.

**B.** When using this job aid, the POI should make a side-by-side comparison of the operator's proposal to make the following determinations:

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- Whether training modules provide for training on the required elements and events in terms of flight crew member duties and procedures; and
- Whether sufficient training module elements and events are outlined to ensure that the appropriate depth and scope of the material will be presented.

**NOTE:** Although some elements and events in general emergency training are “aircraft-specific” (such as exits and slides or slide rafts), the majority of the elements and events should apply to the operator’s aircraft fleet.

C. The job aid is organized with the training subjects listed in the left column and evaluation criteria listed horizontally across the top. Inspectors may use the spaces within the matrix for items such as notes, comments, dates, and checkmarks. There are also blank columns and rows in the job aid that permit POIs to add other training modules or evaluation criteria.

**Table 4.21.4.5. Flight Crew Member General Emergency Training Job Aid**

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**SUBJECT AREA 1: EMERGENCY SITUATION TRAINING**

TRAINING SUBJECTS	EVALUATION CRITERIA			
	ADEQUACY OF ELEMENTS/ EVENTS	ADEQUACY OF COURSEWARE TRAINING	AIDS AND FACILITIES	REMARKS
Duties and Responsibilities				
Crew Coordination				
Aircraft Fires				
First Aid Equipment				
Illness, Injury, and Basic First Aid				
Ground Evacuation				
Ditching Procedures				
Rapid Decompression				
Previous Accidents and Incidents				
Basic Survival Training				

**SUBJECT AREA 2: EMERGENCY DRILL TRAINING**

TRAINING SUBJECTS	EVALUATION CRITERIA			
	ADEQUACY OF ELEMENTS/ EVENTS	ADEQUACY OF COURSEWARE TRAINING	AIDS AND FACILITIES	REMARKS
Hand-Held Fire Extinguishers				
Emergency Oxygen System				
Emergency Exits and Slides*				
Life Preservers				
Ditching Procedures**				

**NOTE:** \*Each crew member is only required to participate in one emergency evacuation using a slide during initial new-hire or initial equipment training.

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**NOTE:** \*\*Crew members are not required to deploy, remove, detach, transfer, or inflate slides or slide rafts on the aircraft or training device.

**4.21.4.33. SMOKE GOGGLES AND OXYGEN MASKS.**

**A.** POIs should:

- 1) Discuss with each operator the extreme importance of revising operator's checklists and expanded procedures in the appropriate Operations Manual (OM) to require that both smoke goggles and oxygen masks be donned at the first indication of any unidentified odor.
- 2) Determine that each operator's approved training program provides sufficient hands on training for all Protective Breathing Equipment (PBE). In addition each training program must ensure that each flight crew member is proficient in donning the oxygen mask and smoke goggles. Flight crew members must be able to don the smoke goggles and oxygen mask within 15 seconds.
- 3) Determine that each operator's training program, checklists, OM and amendments to those manuals and training programs are in compliance with GACAR § 121.1185 that states, before each flight, each item of PBE at flight crew member duty stations must be checked by the flight crew member who will use the equipment.
- 4) Work with the operator to determine which PBE is universal-fit and which is not. This information must then be made available to flight crews.
- 5) Ensure that each operator locates flight crew member PBE (i.e., smoke goggles and oxygen mask), in a ready position at each flight crew member duty station in a manner that is immediately available. Smoke goggles must not impair the wearer's vision and must allow corrective glasses to be worn without impairment of vision or loss of protection.

**B.** Aviation safety inspectors (Inspectors) conducting en route inspections, should actively emphasize compliance with GACAR § 121.1185.

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## **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

#### **Section 5. Flight Crew Aircraft Ground Training Curriculum Segments**

**4.21.5.1. GENERAL.** This section specifies the objectives of aircraft ground training. Structure and content of flight crew aircraft ground training curriculum segments are discussed. Also, three distinct areas of aircraft ground training are identified. They are: general operational subjects, aircraft systems, and systems integration training.

**4.21.5.3. AIRCRAFT GROUND TRAINING OBJECTIVES.** The primary objective of aircraft ground training is to provide flight crew members with the necessary knowledge for understanding the basic functions of aircraft systems, the use of the individual system components, the integration of aircraft systems, and operational procedures. An important requirement of an aircraft ground training curriculum segment is that, upon completion, a student will be sufficiently prepared to enter the flight training curriculum segment. Aircraft ground training, as used in this section, is training for a specific aircraft type. Aircraft ground training may be conducted using many methods, including classroom instruction, ground training devices, computer-based instruction, flight crew training devices and static aircraft.

**4.21.5.5. AIRCRAFT GROUND TRAINING CURRICULUM SEGMENTS.** Flight crew must successfully complete an aircraft ground training curriculum segment for the appropriate category of training (initial new-hire, initial equipment, transition, upgrade, recurrent, or requalification training). Each aircraft ground training curriculum segment consists of training modules containing pertinent subject matter appropriate to the category of training. Training modules may be designed to be used interchangeably in the various categories of training. For example, a hydraulic system training module could be used in initial new-hire, initial equipment, and transition training.

#### **4.21.5.7. AIRCRAFT GROUND TRAINING MODULES.**

A. An aircraft ground training curriculum segment must include as many training modules as necessary for appropriate training to occur. Each module outline must provide at least:

- A descriptive title of the training module, and

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- A list of the related elements or events that will be presented during instruction on the module

**B.** The training module outline must contain sufficient elements or events to ensure that a student will receive training on the main features of individual systems, the operation of individual systems, and the integration of those systems with other aircraft systems. It is unnecessary to include detailed descriptions of each element within a training module outline. However, such detailed descriptions are appropriate and should be included in the operator's courseware. During the approval process, a Principal Operations Inspector (POI) should review courseware as necessary to ensure that the scope and depth of the training modules are adequate. Table 4.21.5.1 illustrates one of the many acceptable methods of presenting an aircraft ground training module outline:

**Table 4.21.5.1. Ground Training Module Example**

<b>7. HYDRAULIC SYSTEM (B747-200)</b>	<i>Descriptive Title</i>	<i>Elements Within a Training Module</i>
(a) A System		
(b) B System		
(c) Standby System		
(d) System Layout		
(e) Limitations		
(f) Controls and Annunciators		
(g) Introduction to Procedures		

**C.** The job aid at the end of this section is provided to assist POIs when determining whether the scope and depth of the aircraft ground training modules are acceptable. Table 4.21.5.2 illustrates the interrelationship of curriculum segments and training module outlines:

**Table 4.21.5.2. Curriculum Segments and Training Module Example**

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A. Objective of Training:	<i>Objective Statement</i>
B. General Operational Subjects:	<i>Subject Area Titles</i>
C. Aircraft Systems:	
1. Aircraft General, Equipment and Furnishings, Emergency Equipment	
2. Fire and Overheat Protection, Warning Systems, Lighting	
3. Powerplants, APU	
4. Electrical System Training Modules	
5. Pneumatic System, Air Conditioning, Within a Pressurization Curriculum	
6. Ice and Rain Protection, Oxygen System Segment	
7. <i>Hydraulic System</i>	<i>Descriptive Title</i>
8. Landing Gear and Brake System	
9. Flight Controls	
10. Fuel System	
11. Navigation System	
12. Flight Instruments, Communication Equipment	
13. Review	
14. Written Exam	
7. <i>HYDRAULIC SYSTEM TRAINING MODULE</i>	<i>Descriptive Title</i>
(a) Yellow System	
(b) Green System	
(c) Standby System Elements	
(d) System Layout	
(e) Limitations Training	
(f) Controls and Annunciators Module	

**4.21.5.9. TRAINING HOURS.** The number of training hours must be specified on all aircraft ground training curriculum segment outlines. It is difficult to provide guidance on acceptable training hours for aircraft ground training curriculum segments because of the various situations that can be encountered. POIs must thoroughly study the operator's proposals. Based on experience with the operator, past experiences with other operators, as well as their own training experiences, POIs must use reasonable judgment when determining whether the training can be adequately accomplished within the training hours specified in the curriculum segment. Certain training methods, such as computer-based instruction, allow students to progress through training at a rate that depends on each individual student's ability to assimilate the required knowledge or abilities. For these kinds of training methods, the specified training hours should be indicative of the time an average student will progress through training.

A. Table 4.21.5.4 provides direction and guidance for determining acceptable training hours for

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aircraft ground training curriculum segments. Generally, training hours listed in this table approximate training days or fractions of days. Periods for reasonable breaks during instruction are included in these training hours. The table provides two sets of training hours for the various categories of training and families of aircraft.

- 1) The first set is considered to be the norm and reasonable training support is presumed, such as proficient instructors, well-organized courseware, and modern training devices or aids. The norm must not be construed as being always acceptable. When determining the adequacy of training hours, POIs should use the national norm as a point from which other factors shall be weighed. There may be many reasons why the training hours need to be greater than the norm. The operator may need to specify more hours because of the complexity of the aircraft or types of operation. The POI may need to require more hours because of inadequate training support. Conversely, training hours less than the national norm may be fully acceptable due to the use of highly sophisticated and modern training methods, the use of less complex aircraft, or the use of a less complex type of operation.
- 2) The second set of training hours, in parentheses, is an established threshold for training hours. Threshold training hours are established for particular categories of training and families of aircraft. Before granting initial approval to a curriculum segment with less than the established threshold training hours, a POI must ensure that the training to be given provides sufficient training and meet the objective of the curriculum segment. When granting initial approval of curriculum segments with training hours below the established threshold training hours, POIs must notify the Director, Flight Operations Division, that such initial approval has been granted.
- 3) Training hour norms have not been established for upgrade ground training curriculum segments. Upgrade ground training requirements vary widely depending on a flight crew member's experience, previous duty position, and currency status in the aircraft for which training is being conducted. In cases when students have not served on the aircraft for a long time, upgrade ground training may need to be as extensive as initial equipment training. In other cases when students are currently qualified on the aircraft, either as flight engineers (FE) or second-in-commands (SIC), the upgrade ground training may only be that training necessary to qualify them in the new duty position. In such cases, an operator may be able to expand or conduct upgrade flight training and qualify students for the new duty positions without a separate upgrade ground training curriculum segment.

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a) Table 4.21.5.3 provides several factors to be considered when evaluating upgrade ground training curriculum segments:

**Table 4.21.5.3. Upgrade Ground Training**

UPGRADE GROUND TRAINING			
FLIGHT CREW MEMBER STATUS	GENERAL OPERATIONAL SUBJECTS	AIRCRAFT SYSTEMS	SYSTEMS INTEGRATION
SIC (current on aircraft) upgrade to PIC	Training modules or elements pertaining to PIC duty position	May not be needed	Training modules or elements pertaining to PIC duty position
SIC (NOT current on aircraft) upgrade to PIC	Training modules or elements pertaining to PIC duty position	Appropriate training modules depending on time NOT current	Appropriate training modules depending on time NOT current
F/E (current on aircraft) upgrade to SIC	Training modules pertaining to SIC duty position	May not be Needed	Training modules or elements pertaining to SIC duty position
F/E (NOT current on aircraft) upgrade to SIC	Training modules or elements pertaining to SIC duty position	Appropriate training modules depending on time NOT current	Appropriate training modules depending on time NOT current

b) Training hour thresholds for upgrade ground training curriculum segments have been established. The Director, Flight Operations Division must be notified of any upgrade ground training curriculum segment that specifies fewer training hours than the threshold hours listed in Table 4.21.5.4.

**Table 4.21.5.4. FLIGHT CREW AIRCRAFT GROUND TRAINING HOURS NORMS**

**(THRESHOLDS)**

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Aircraft  TRANSPORT & COMMUTER CATEGORY AIRCRAFT	Kind of Operation	CATEGORY OF TRAINING				
		Initial New Hire	Initial Equipment	Transition	Upgrade	Recurrent
Part 121 Turbopropeller	72(56)	64(48)	64(48)	(16)	16(8)	
	72(56)	64(48)	64(48)	(16)	16(8)	
	80(64)	80(64)	80(64)	(24)	16(8)	
ALL M U LTI ENGINE	Part 135 IFR/VFR	32(16)	24(16)	24(16)	(8)	8(4)
	Part 135 VFR Only	24(16)	20(8)	20(8)	(4)	4(4)
ALL SINGLE ENGINE	Part 135 IFR/VFR	20(8)	16(8)	16(8)	(4)	8(4)
	Part 135 VFR Only	12(8)	8(4)	8(4)	(4)	4(4)
NON-TRANSPORT CATEGORY ROTORCRAFT	IFR/VFR	32(16)	24(16)	24(16)	(8)	8(4)
	VFR Only	24(16)	20(8)	20(8)	(4)	4(4)

General Authority of Civil Aviation Regulations (GACAR) §§ 121.887 and 121.919 specify GACAR-programmed hour requirements for initial new-hire, initial equipment, and recurrent aircraft ground training curriculum segments. The regulatory programmed hours for these categories of training are listed in Table 4.21.5.5, as follows:

Table 4.21.5.5. PART 121 REGULATORY PROGRAMMED HOURS

**GACAR-Programmed Hours by Category of Training,**

	Initial New Hire	Initial Equipment	Recurrent
Turbopropeller	80	80	20
Turbojet	120	120	25
Rotorcraft	TBD	TBD	TBD

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- 1) Under GACAR § 121.851(d), a POI is authorized to approve reductions to the GACAR programmed hour requirements of these three categories of training. When approving reductions to the GACAR programmed hours, the POI must determine that the training aids, devices, and methods and procedures used by the operator will increase the quality and effectiveness of the training. The letter that transmits initial or final approval of these Part 121 aircraft ground training curriculum segments must contain a statement giving the basis for the reduced GACAR-programmed hours (see paragraphs 4.21.2.21 and 4.21.2.29 in Section 2 of this chapter. The Director, Flight Operations Division must be notified (as described in paragraph 4.21.5.9, A, 2)) of any reduction below the GACAR programmed hours if that reduction is also below the threshold training hours in Table 4.21.5.4.
- 2) There are no other categories of training in Part 121 that specify GACAR-programmed hour requirements. Part 135 does not specify any GACAR programmed hour requirements.

**4.21.5.11. COURSE COMPLETION REQUIREMENTS.** Completion of the curriculum segment must be documented by an instructor's or supervisor's certification that the student has successfully completed the course. This certification is usually based on the results of a written examination given at the end of the course. With some training methods, the certification may be based on student progress checks administered during the course.

**4.21.5.13. CONTENT OF AIRCRAFT GROUND CURRICULUM SEGMENTS.** An aircraft ground curriculum segment must show that training will be given in three distinct subject areas appropriate to the specific aircraft. These subject areas of training are "general operational subjects" (see paragraph 4.21.5.15), "aircraft systems" (see paragraph 4.21.5.17), and "systems integration" (see paragraph 4.21.5.19). An operator should develop separate training modules for each of these distinct areas of training. Usually, training in systems integration should occur during the latter part of the course. However, other methods of training module development and sequencing of training may be fully acceptable.

**4.21.5.15. GENERAL OPERATIONAL SUBJECTS.** The subject area of ground training, referred to as "general operational subjects," includes instruction on certain operational requirements that are specific to the aircraft in which the training is being conducted. The general operational subject area of an aircraft training curriculum segment may include instruction on many operational subjects but should include instruction in at least the following:

- A. Dispatch, flight release, or flight locating procedures applicable to the specific type of

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operation

**B.** Mass and balance procedures specific to the aircraft (including computation of company mass and balance forms)

**C.** Adverse weather practices, including procedures specific to the aircraft that must be followed when operating in the following conditions:

- Sand storms
- Icing
- Turbulence
- Heavy precipitation
- Thunderstorms with associated windshear and microburst phenomena
- Low visibility
- Contaminated runways

**D.** Procedures for operating specific aircraft communications and navigation equipment in accordance with the following:

- Specific company communications requirements
- ATS clearance requirements
- Area departure and arrival requirements
- En route requirements
- Approach and landing requirements

**E.** Specific performance characteristics of the aircraft during all flight regimes, including:

- The use of charts, tables, tabulated data, and other related manual information

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- Normal, abnormal and emergency performance problems
- Meteorological and mass-limiting performance factors (such as temperature, pressure, contaminated runways, precipitation, and climb/runway limits)
- Inoperative equipment performance limiting factors (such as MEL/CDL, and inoperative anti-skid)
- Special operational conditions (such as unpaved runways, high altitude aerodromes, and drift down requirements)

F. Table 4.21.5.6 illustrates one of many acceptable methods in which the “general operational subjects” area of an aircraft ground training curriculum segment could be outlined (including a typical training module):

**Table 4.21.5.6. General Operational Subjects Example**

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 A. OBJECTIVE OF TRAINING: ← *Objective Statement*

 B. GENERAL OPERATIONAL SUBJECTS:  →

*Title of  
Subject  
Area*

- 1. Flight Control
- 2. Mass and Balance
- 3. Operations Specifications  
(Authorizations and Limitations)
- 4. *Adverse Weather*
- 5. Flight Planning
- 6. Aircraft Operations Manual
- 7. Company Operations Manual  
(Applicable Aircraft Sections)
- 8. Performance

*Training Modules within  
a Curriculum Segment  
Applicable to a Specific  
Aircraft in General  
Operational Subject Area*

 → 4. *ADVERSE WEATHER*

- (a) Operations in sand storm, ice, slush, and snow
- (b) Operations in turbulence
- (c) Operations in heavy precipitation
- (d) Thunderstorm, windshear, and microburst procedures
- (e) Low visibility operations

*Elements  
within a  
Training  
Module*

**4.21.5.17. AIRCRAFT SYSTEMS.** The second subject area of an aircraft ground curriculum segment is the “aircraft systems” area. This area is particularly adaptive to the use of training modules because of the modular nature of each system and its related components. Instruction on each aircraft system must be given in sufficient detail to ensure the student clearly understands system components, limitations, relevant controls, actuators, annunciators, and procedures for various system configurations. An example of one of the many acceptable methods in which the aircraft systems subject area of an aircraft ground curriculum segment outline could be presented is illustrated in Table 4.21.5.2. It is not possible to list every conceivable aircraft system that should be included in the

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aircraft ground curriculum segment. However, the following descriptions of training modules (with typical elements) illustrate the depth and scope that should be provided for an operator's submission to be acceptable.

**A. Aircraft General.** Typical elements include an overview of the basic aircraft, such as dimensions, turning radius, panel layouts, cockpit and cabin configurations, and other major systems and components or appliances.

**B. Powerplants.** Typical elements include a basic engine description, engine thrust ratings, engine components such as accessory drives, ignition, oil, fuel control, hydraulic, and bleed air features.

**C. Electrical.** Typical elements should include elements identifying the sources of aircraft power including engine-driven generators, auxiliary power unit (APU) generator, and external power. Other elements include the electrical buses and related components such as circuit breakers, fuses, the aircraft battery, and other standby power systems, if applicable.

**D. Hydraulic.** Some typical elements are the hydraulic reservoirs, pumps, accumulators; the means of routing hydraulic fluid through filters, check valves, interconnects, and to associated actuators and hydraulically-operated components.

**E. Fuel.** Elements include the fuel tank system (location and quantities), engine-driven pumps, boost pumps, system valves, crossfeeds, quantity indicators, and provisions (if applicable) for fuel jettisoning.

**F. Pneumatic.** Typical elements include bleed-air sources (such as engines, APU, or external ground air), the means of routing, venting, and controlling bleed air via associated valves, ducts, chambers, and temperature and pressure limiting devices.

**G. Air Conditioning and Pressurization.** Typical elements include heaters, air conditioning packs, fans, and other environmental control devices. Pressurization system components include elements such as outflow and negative pressure relief valves with associated automatic, standby, and manual pressurization controls and annunciators.

**H. Flight Controls.** Elements in flight controls include primary (yaw, pitch, and roll devices) and secondary controls (leading/trailing edge devices, flaps, trim, and damping mechanisms). Elements that indicate the means of actuation (direct/indirect or flyby-wire) should be included

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as well as applicable redundancy devices.

**I. Landing Gear.** Typical elements should include the landing gear extension and retraction mechanism including the operating sequence of struts, doors, and locking devices, and brake and antiskid systems, if applicable. Other elements are steering (nose or body steering gear), bogie arrangements, air/ground sensor relays, and visual downlock indicators.

**J. Ice and Rain Protection.** Elements should include rain removal systems and each anti-icing and/ or deicing system that prevents or removes the formation of ice from airfoils, flight controls, engines, pitot-static probes, fluid outlets, cockpit windows, and aircraft structures. Other elements should include system components such as pneumatic/electrical valves, sensors, ducts, electrical elements, or pneumatic devices.

**K. Equipment and Furnishings.** Typical elements are the aircraft exits, galleys, water and waste systems, lavatories, cargo areas, crew member and passenger seats, bulkheads, seating and/or cargo configurations, and non-emergency equipment and furnishings.

**L. Navigation Equipment.** Typical elements are flight navigation system components including flight directors, horizontal situation, radio magnetic indicators, navigation receivers (ADF, VOR, GNSS, RNAV, Marker Beacon, DME) used on the aircraft. Other elements include applicable inertial systems (INS, IRS), functional displays, fault indications, and comparator systems; aircraft transponders, radio altimeters, weather radar, and cathode ray tube or computer-generated displays of aircraft position and navigation information.

**M. Auto Flight System.** Typical elements include such items of equipment as the autopilot, autothrottles and their interface with aircraft flight director and navigation systems, including automatic approach tracking, autoland, and automatic fuel or performance management systems.

**N. Flight Instruments.** Typical elements should include an overview of the panel arrangement and the electrical and pitot-static sources and alternate sources for the flight instruments. Other elements include attitude, heading (directional gyro and magnetic), airspeed, vertical speed, altimeters, standby flight instruments, and other relevant instruments.

**O. Communication Equipment.** Elements include the VHF/HF radios, audio panels, inflight interphone and passenger address systems, the voice recorder, and air/ ground passive communications systems (ACARS).

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**P. Warning Systems.** Typical elements are aural, visual, and tactile warning systems, including the character and degree of urgency related to each signal. Other elements include warning and caution annunciation systems, including ground proximity and takeoff warning systems.

**Q. Fire Protection.** Elements should include all fire and overheat sensors, loops, modules, or other means of providing visual and/or aural indications of fire or overheat detection. Other elements include procedures for the use of fire handles, automatic extinguishing systems, agents, and the power sources necessary to provide protection for fire and overheat conditions in engines, APU, cargo bay/wheel well, the cockpit, cabin, and lavatories.

**R. Oxygen.** Typical elements are the aircraft oxygen system including the installed passenger, crew, and portable systems. Other elements include sources of oxygen (gaseous or solid), flow and distribution networks, automatic deployment systems, regulators, pressure levels, gauges, and servicing requirements.

**S. Lighting.** Typical elements are the cockpit, cabin, and external lighting systems, including power sources, switch positions, and spare light bulb locations.

**T. Emergency Equipment.** Typical elements are the type, location, and purpose of each item of emergency equipment such as fire and oxygen bottles, first aid kits, medical kits, life rafts, life preservers, crash axes, and emergency exits and lights. Other elements include each item of egress equipment such as slides, slide rafts, escape straps or handles, hatches, ladders or movable stairs.

**U. Auxiliary Power Unit (APU).** Elements should include installation of the APU, APU capacity and operation including its electrical and bleed air capabilities and how it interfaces with the aircraft's electrical and pneumatic systems. Other elements include the APU components such as inlet doors, exhaust ducts, and fuel supply.

### 4.21.5.19. AIRCRAFT SYSTEMS INTEGRATION TRAINING.

**A.** The third subject area of a ground training curriculum segment is referred to as "Systems Integration Training." This area provides the student with training on how aircraft systems interrelate with respect to normal, abnormal, and emergency procedures. This training includes procedures as basic as those for powering the aircraft electrical and pneumatic systems with the APU or as complex as those for programming computerized navigation and autoflight systems. System integration training should include flight crew interaction in the use of checklists, cockpit resource management, and other operational procedures. It is normally conducted using

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ground training devices portraying a specific cockpit layout, including the switch and indicator/annunciator logic. The flight crew training devices described in the flight training section (Section 6) may be used for systems integration training. Additionally, computer-based instruction or other interactive systems may be used for this training. Integration training may be conducted in conjunction with aircraft systems training or as a later phase of the aircraft ground training curriculum segment.

**B.** Effective systems integration training serves as a logical bridge between conventional ground training instructional delivery methods and flight training. This training allows students to become familiar with the cockpit layout, checklists, operator procedures, and other areas that are best learned before they conduct actual flight maneuvers and procedures. POIs should consider this type of training, and the quality and capability of the involved training devices, as factors in the decision for reducing training hours.

**C.** The following examples are of aircraft systems integration training modules with typical elements:

- 1) *Use of Checklist.* Typical elements include safety checks, cockpit preparation (switch position and checklist flows), checklist callouts and responses, and checklist sequence.
- 2) *Flight Planning.* Elements should include performance limitations (meteorological, mass, and MEL/CDL items), required fuel loads, weather planning (lower than standard takeoff minimums or alternate requirements).
- 3) *Display Systems.* Typical elements include the use of weather radar and other CRT displays (checklist, vertical navigation or longitudinal navigation displays).
- 4) *Navigation Systems.* Elements include preflight and operation of applicable receivers, onboard navigation systems, and flight plan information input and retrieval.
- 5) *Autoflight.* Typical elements include the autopilot, autothrust, and flight director systems, including the appropriate procedures, normal and abnormal indications, and annunciators.
- 6) *Cockpit Familiarization.* Typical elements include activation of aircraft system controls and switches to include normal, abnormal, and emergency switches and control positions, and relevant annunciators, lights, or other caution and warning systems.

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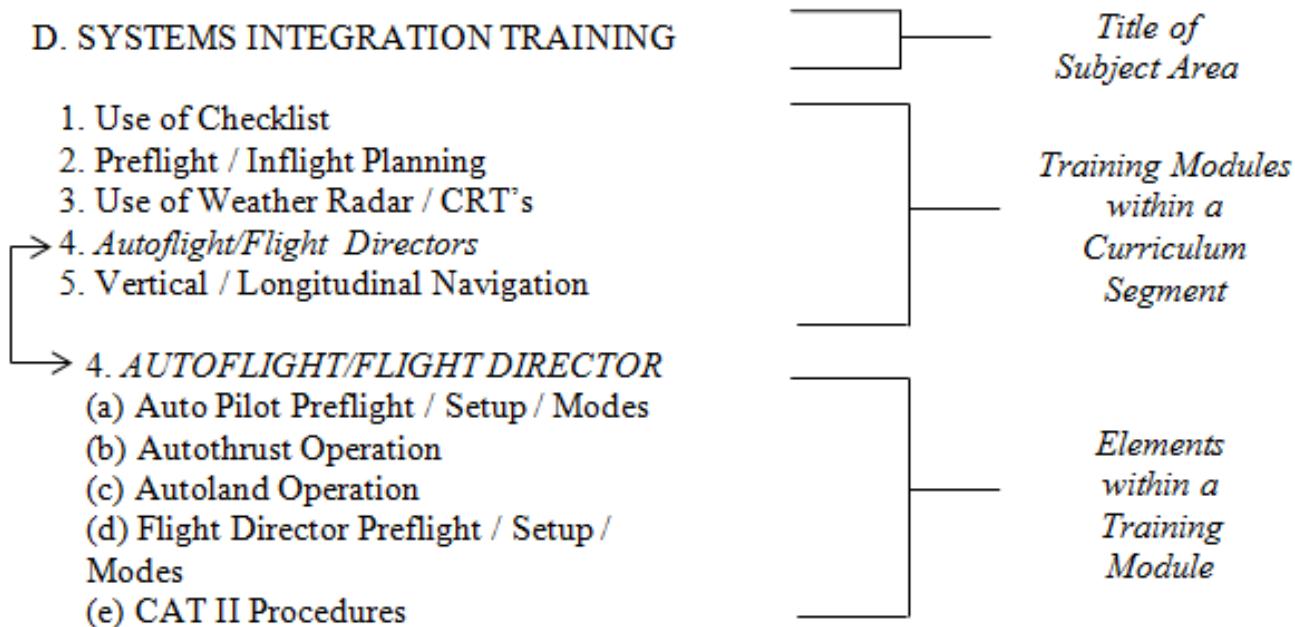
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**D.** Aircraft systems integration training may be as simplistic as students learning checklist procedures in a single-engine aircraft or as complex as programming aircraft computer systems for an international flight. Integration training is particularly effective when an aircraft is equipped with relatively sophisticated computerized navigation, flight director, performance, and autoflight systems. The key to effective training in this area is to use a training device that provides an accurate, real time, and interactive medium for the students during the practice of procedures. The functional requirements of the training device do not necessarily require motion or visual systems or specific aircraft flight data characteristics. However, the training device should accurately portray relevant keyboards, switches, CRTs and include air/ground and flightpath logic.

**E.** Table 4.21.5.7 illustrates one of the many acceptable methods in which the “aircraft systems integration” subject area of an aircraft ground training curriculum segment could be outlined (including a typical training module):

**Table 4.21.5.7. Aircraft System Integration**



### 4.21.5.21. GROUND TRAINING DEVICES.

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**A.** Ground training devices are commonly used by operators in the conduct of aircraft ground training. The level of sophistication of these devices may range from a simple paper pictorial display to a static aircraft. They may include slide/tape presentations, computer-based instruction systems, aircraft system panels, models, mockups, flight crew training devices and numerous other instructional delivery methods. POIs approve or accept each ground training device for use when granting initial or final approval of a ground training curriculum segment for the operator.

**B.** Ground training devices used for systems integration training must be individually evaluated by the POI. If these devices are also used for flight training (level 6 and 7 flight training devices (FTDs) or level A through D full flight simulators (FFS)) they must be evaluated and found satisfactory for flight training in accordance with GACAR Part 60.

### **4.21.5.23. EVALUATION OF GROUND TRAINING CURRICULUM SEGMENT OUTLINES**

**FOR INITIAL APPROVAL.** When evaluating an aircraft ground training curriculum segment outline the POI must determine whether it meets the following criteria:

**A.** The training hours specified in each curriculum segment outline must be examined. POIs should not attempt to measure the quality or sufficiency of training by the amount of training hours alone. Adequacy of quality and sufficiency of training can only be determined by direct observation of training and testing (or checking) in progress or by examination of surveillance and investigation reports. However, the specified training hours must be realistic in terms of the amount of time it will take to accomplish the training outlined in the curriculum segment. Any request and the appropriate justification for reductions to training hours must be submitted with the initial proposal.

**B.** The curriculum segment outline contains appropriate training modules for the specific aircraft. The training modules should have sufficient elements or events to ensure that the quality and depth of training given in a particular subject area will be provided.

### **4.21.5.25. CREDITING DISTANCE LEARNING AS A COMPONENT OF GROUND TRAINING FOR FLIGHT CREWS.**

**A. Background.** In the so-called “information age,” many new information-sharing systems have been developed. Those systems have been centered largely on digital technology involving desktop computers and the Internet. Those systems include modern training products, many of which are being used effectively today in aviation courses conducted by accredited universities

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and in air operator training programs approved by the GACA. Collectively, those products fall under a relatively new heading that has been called “distance learning”. As the quality of those products continues to improve, the training/learning process stands to benefit even more. Previous guidance seemed to presume that traditional classroom training was inherently superior to other ground training. That presumption was reflected in this order and elsewhere. Besides the proven effectiveness of modern training products, distance learning affords a low-cost alternative to classroom ground training, an alternative that is timely and appropriate in today’s challenging economic environment. The updated guidance that follows should promote wider implementation of modern ground training methods apart from the traditional classroom.

**B. Applicability.** This paragraph applies to flight crew (pilots and flight engineers) training programs subject to GACA approval under GACAR Part 121 and 135. It may also be useful to aviation safety inspectors (Inspectors) who oversee training related to GACAR Part 142 (Training Centers). Creditability of hours spent in distance learning activities applies to the programmed hours of ground training specified in Part 121 regulations

**C. Distance Learning, Definition.** Distance learning is a term currently not used in GACARs. It is a term used in the aviation industry with various meanings depending on context. For the purposes of this handbook, distance learning means learning that is accomplished by any training method not including an instructor and a gathering of trainees collocated in a traditional classroom. (Distance learning is known by other terms such as E-learning, home study, self-guided training, virtual classroom, distributed training, computer-based training, Web-based training, and others.)

**D. Interim Guidance.** Experts continue to develop a systematic approach for using the many effective training methods and products now available. It is unlikely that the last word will be written in the foreseeable future, if ever, since there is apparently no end to the prospects. The guidance contained in this paragraph applies until superseded, and should be used to help implement and standardize distance learning among operators.

**E. Training Objectives, and Proficiency.** A training objective is a desired performance or behavior demonstrated under certain conditions with respect to specific standards. One way to identify training objectives, and to verify that they have been met (also known as validation), by a three-tier scheme comprising knowledge, skill, and performance.

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1) *Knowledge*. Specific information required enabling a student to develop the skills and attitudes to effectively recall facts, identify concepts, apply rules or principles, solve problems, and think creatively. Because knowledge is covert, students must be assigned overt activities to demonstrate their knowledge base.

- May be validated through written, electronic, or oral testing
- Examples: Learning facts by rote, such as an operator's history, organization, and general policies, commit an airplane flight manual's Limitations to memory, or to get a basic understanding of an airplane's systems.

2) *Skill*. An ability enabled by knowledge to perform an activity or action. Skills are often grouped into cognitive skill and psychomotor skill categories

a) Cognitive skill: Ability to perform a task requiring the manipulation of words, numbers and symbols. This skill requires the application of knowledge. Usually involves classification, the application of (mental) rules, procedures or principles, the solution of problems or the application of creative thinking.

- May be validated through written, electronic, or oral testing or through task performance
- Examples: Challenging a pilot trainee to apply knowledge of an airplane's Limitations to a mass and balance computation; or to apply basic systems knowledge to operating aircraft systems, and programming the flight management system (FMS)

b) Psychomotor skill: Ability to perform a task requiring dexterity, coordination and muscular activity. This requires the application of knowledge. Usually involves the manipulation of objects or materials and the use of fine and gross muscular movement in a coordinated manner.

- May be validated through performance of a task
- Example: Operation of an emergency exit by normal and alternative methods

3) *Performance*. The ability to accomplish useful work by combining knowledge, skill, and

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intangibles such as inference and judgment (sometimes called “soft skills”).

- May be validated through performance of related tasks, sometimes called event sets
- Example: Demonstrating competence as pilot-in-command during an instrument landing system (ILS) approach

**F. Scope of Creditability of Distance Learning.** Distance learning credit is appropriate for Knowledge and Cognitive Skill objectives. Creditability of distance learning is more complicated in regard to psychomotor skills and performance, and is not addressed in this paragraph.

**G. Limits on Creditability of Distance Learning.** The General Authority of Civil Aviation (GACA) recognizes the great training potential of distance learning that is well planned and effectively validated. Ground training developed in accordance with an implementation plan (described below) is subject to GACA approval. Distance learning may be as much 100 percent creditable toward the Knowledge and Cognitive Skill training objectives in all ground training, including the following training categories:

- Basic Indoctrination
- Initial New-Hire
- Initial Equipment
- Transition
- Upgrade
- Recurrent
- Requalification

**H. Ground Training Media.** The general nature and specific characteristics of training media used for distance learning vary widely. Examples include paper media, videotape, computer based training (CBT), CDs, Web-based training, and virtual classroom. The media used should meet the requirements of the respective training objective. Validation of training effectiveness is one of the

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most important components of the implementation plan described below.

**I. Implementation Plan.** Any proposal for ground training to be accomplished by distance learning should include a plan for start-up, validation, operation, and maintenance of that training. This plan should include at least the following elements:

1) *Start-up.* Identification of knowledge and cognitive training objectives.

a) Ground training objectives can be reduced to simple terms such as being able

- To recall
- To recognize
- To comprehend
- To apply

• Identification of the media to be used for ground training and testing

- A validation strategy that addresses (1) the effectiveness of the ground training itself and (2) the learning accomplished by each person trained. Key features of a validation strategy are shown below.

b) Effectiveness of the ground training being conducted.

• *Setting a reference.* One validation method is to establish a performance baseline from which to measure the effectiveness of the ground training proposed. Baselines exist in most on-going air carrier training programs. Examples of performance baselines include average ground training hours a trainee spends in learning a certain subject, average pass-fail rates for tests of ground training content, median scores, average pass-fail rates for flight checks, and many others. A performance baseline may be set by using an existing baseline or by referring to some other existing standard.

• *Maintaining currency.* Validation depends upon maintaining the currency of the ground training to be conducted. A reliable method to do so is an essential part of

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a ground training proposal.

- *Tracking.* A method for keeping test results and tracking overall performance
- c) Learning accomplished by each person trained.
- *A strategy for testing.* Testing should be designed to determine that training objectives are being met by each trainee.
  - *Integrity of tests.* A method should be developed to ensure integrity of tests, including integrity of test questions and test answers, and controlled access to tests and test results
  - *Tracking.* A method for keeping test results and tracking each individual's performance
- 2) *Validation.* Validation of ground training is a determination that the training proposed actually succeeds in meeting the performance objectives for that training. Two essential assessments comprise validation of ground training.
- a) Systems Knowledge Validation. Assessment of a student's technical knowledge, accomplished by written or oral test.
  - b) Cognitive Skill Validation. Assessment of an individual's application of knowledge in respect to operation of systems, which may be accomplished by written or oral test, or by a more subjective evaluation by a subject matter expert such as an authorized ground instructor or an approved check pilot.
- 3) *Passing Grade – 80 Percent.* If an electronic testing system (ETS) is used instead of an oral test or oral evaluation, minimum passing score should be 80%. Any incorrect test answers should be addressed at the time of the test, and should be corrected to 100%. A score less than 80% would require retraining in all substandard areas, and retesting.
- 4) *Integrity of test questions depends on several factors.*
- a) Scope. A test for an initial or transition trainee should include at least one question for each element contained in each training module. Ground training and testing for

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trainees in other curriculum segments (e.g., upgrade, recurrent, requalification) may be less comprehensive, but should cover significant and timely subjects, particularly new material and changes since one's previous recurrent ground training.

**NOTE:** An element is a subgroup of related content within a training module. It is the fourth level of curriculum detail—curriculum, curriculum segment, training module, element. For example: Hydraulic System is one training module; the yellow system, the green system, and the standby system are elements.

b) Library. A library of questions should be developed that thoroughly cover the training objectives.

c) Multiple Questions. Where possible, multiple questions should be developed for each training objective.

d) Uniqueness. Tests should be generated by random selection of questions from the library, so that no two tests are alike.

e) Currency. Test questions should be reviewed as often as necessary to assure their relevancy, and to incorporate new or changed material

5) *Integrity of Test Answers.* Trainers should develop measures by which the identity of a person taking the test may be confirmed, and printed or electronic test answers may not be reproduced and distributed among trainees so as to beat the test.

6) *Operations and Maintenance.* Includes quality control procedures for the collection, protection, and analysis of data for tracking ground training effectiveness; also, a strategy for equipment upgrade, program update, and program adjustments driven by data and feedback from trainers and trainees.

**J. Interactivity.** Training developers should provide for interactivity between trainees and authorized ground instructors, and between the trainees themselves.

1) When in the field. In particular, a trainee should have ready access to an authorized ground instructor during normal business hours to resolve questions encountered during distance learning and pertinent testing.

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2) When at a centralized training location. Before flight training, trainees should be convened in a proctored classroom setting with an authorized ground instructor to resolve any remaining issues arising during distance learning. This interactivity is particularly beneficial in respect to standardization of trainees in initial new-hire and initial equipment curricula.

### **4.21.5.27. AIRCRAFT GROUND TRAINING CURRICULUM SEGMENT JOB AID.**

**A.** The aircraft ground training curriculum segment job aid (Table 4.21.5.8) is provided to assist the Inspector in evaluating curriculum segments. The job aid is provided for guidance only and must not be construed as a mandatory or regulatory requirement. The job aid focuses on the three subject areas of this segment: general operational subjects, aircraft systems, and systems integration training. It serves as an aid for evaluating individual training modules.

**B.** When using the job aid, a POI should make a side-by-side comparison of the operator's proposal to determine the following:

- Whether each subject is aircraft-specific in terms of description, company policy, and appropriate procedures
- Whether sufficient training module elements or events are listed to ensure the appropriate depth and scope of the material being presented

**C.** The job aid is organized with the training modules listed in the left column and evaluation criteria or remarks listed horizontally across the top. POIs may use the spaces within the matrix for items such as notes, comments, dates, or checkmarks. There are also blank columns and rows in the job aid in which Inspectors may include additional training modules for systems unique to a particular aircraft and methods or procedures unique to a particular operation.

**Table 4.21.5.8. Aircraft Ground Training Module Job Aid Subject Area 1: General Operation Subjects**

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EVALUATION CRITERIA				
TRAINING SUBJECTS	ADEQUACY OF ELEMENTS/EVENTS	ADEQUACY OF COURSEWARE	TRAINING AIDS AND FACILITIES	REMARKS
Flight Control *				
Mass and Balance				
OpSpecs Authorizations/ Limitation				
Adverse Weather				
Flight Planning				
Aircraft Flight Manual				
Company Operations Manual				
Performance				

\* Flight dispatch, release (Part 121)), or flight locating (Part 135), as applicable.

**Subject Area 2: Aircraft Systems**

EVALUATION CRITERIA				
TRAINING SUBJECTS	ADEQUACY OF ELEMENTS/EVENTS	ADEQUACY OF COURSEWARE	TRAINING AIDS AND FACILITIES	REMARKS
Aircraft General Equipment and Furnishings				
Emergency Equipment				
Powerplants				
Electrical				
Pneumatic				
Air Conditioning and Pressurization				
Ice and Rain Protection				
APU				

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**Subject Area 2: Aircraft Systems, Continued**

Hydraulics				
Landing Gear and Brakes				
Flight Controls				
Fuel				
Communications Equipment				
Flight Instruments				
Navigation Equipment				
Autoflight				
Warning Systems				
Fire and Overheat Protection				
Oxygen				
Performance				

**Subject Area 3: Aircraft Systems Integration**

EVALUATION CRITERIA				
TRAINING SUBJECTS	ADEQUACY OF ELEMENTS/EVENTS	ADEQUACY OF COURSEWARE	TRAINING AIDS AND FACILITIES	REMARKS
Use of Checklist				
Cockpit Familiarization				
Preflight Planning				
Inflight Planning				
Use of Weather Radar/CRTs				
Navigation Systems				
Communication Systems				
Autoflight/Flight Director				

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 6. Flight Training Curriculum Segments**

**4.21.6.1. GENERAL.** This section specifies the objectives of flight training. Both the structure and content of flight training curriculum segments are discussed. Also clarified are the differences between training objectives and qualification objectives. Flight training consists of certain required maneuvers and procedures which are referred to as “training events.” The training events which must be included in flight training curriculum segments to satisfy the requirements of General Authority of Civil Aviation Regulation (GACAR) Part 121 and 135, are specified in the maneuvers and procedures tables (Tables 4.21.6.5 through 4.21.6.11) in this section.

**4.21.6.3. FLIGHT TRAINING OBJECTIVES.** Flight training, as used in this section, means the conduct of training events in an aircraft or a flight simulation training device (FSTD) in accordance with an approved training curriculum. Flight training (except for windshear training) may be conducted entirely in an aircraft. Flight training may also be conducted using a combination of an aircraft with an FSTD. In certain cases, flight training may be conducted entirely in a full flight simulator (FFS). In all cases, the primary objective of flight training is to provide an opportunity for flight crew members to acquire the skills and knowledge necessary to perform to a desired standard. This opportunity provides for demonstration, instruction, and practice of the maneuvers and procedures (training events) pertinent to a particular aircraft and crew member duty position. Successful completion of flight training is validated by appropriate testing and checking.

**4.21.6.5. QUALIFICATION OBJECTIVES.** The objective of the qualification curriculum segment is to determine whether enough learning has occurred by comparing an individual’s performance in practical situations, to established standards. A person meeting the qualification objectives satisfactorily completes the curriculum. A person failing to meet these objectives must be returned to training status. After additional training, that person must retake and satisfactorily complete at least the previously unsatisfactory portions of the qualification curriculum segment.

##### **4.21.6.7. FLIGHT TRAINING MODULES OR EVENT OUTLINES.**

**A. Curriculum Segment.** A flight training curriculum segment may be outlined in a modular

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format or may be outlined as a series of events in which training must be accomplished. This curriculum segment must include as many training modules or events as necessary to provide appropriate training. Each training module or event outline should provide at least the following information:

- A descriptive title of the training module
- A list of the training events that must be accomplished during flight training
- Any specific conditions applicable to a particular training event, such as the weather minimums to be used
- Provisions for briefing before and after each training period

**B. Training Outline.** The operator may submit an outline containing training modules representing blocks of training events, or an outline listing all the elements and events to be accomplished during the flight training. Other forms of presenting the flight training curriculum segment may be acceptable. Regardless of the format used, principal operations inspectors (POIs) should evaluate a proposed flight training curriculum by comparing it with the maneuvers and procedures tables in this section. During actual training, the order and rate of training event presentation may vary. An instructor may vary the events in a published curriculum segment, during any particular period, when a student's progress indicates it is necessary. However, a required event must not be omitted from the curriculum segment. POIs may need to review the operator's flight training courseware, such as lesson plans or instructor guides to assure that a plan exists in which all events will be appropriately accomplished. To further support that a plan exists, the POI may need to review the forms that will be used to record flight training. It is unnecessary for the POI to approve courseware or training record forms.

**C. Aircraft Flight Manual (AFM).** It is unnecessary to include detailed descriptions of how specific maneuvers or procedures will be accomplished in a flight training module outline or training event outline. However, detailed descriptions must be included in an approved AFM, the operator's aircraft operating manual, or in a separate maneuvers and procedures document. Detailed descriptions or pictorial displays are required for certain normal, abnormal, and emergency maneuvers, procedures, and functions which are performed in flight training. POIs may require operators to provide extremely detailed training outlines in any of the following situations:

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- When a new technology or procedure is addressed in the training module (examples include fly-by-wire aircraft control and rotorcraft instrument flight rules (IFR) flight slower than minimum speed ( $V_{MINI}$ ))
- When an operator has had approval of a curriculum segment withdrawn because of deficiencies, the POI may require any redeveloped flight curriculum segments to include highly detailed training module or training event outlines. (The level of detail should provide sufficient information for the POI to determine that previously identified deficiencies are corrected.)

**D. Regulatory Compliance.** To ensure regulatory compliance, the training module or training event outlines must contain at least the training events listed in the appropriate maneuvers and procedures tables in this section. The interrelationship of training modules and/or training events in a curriculum segment should provide for an orderly and practical progression of training. For example, taxiing may be listed as a training event in the first module of a flight training curriculum segment but does not have to be listed in subsequent training modules, even though training on the taxiing maneuver will occur throughout flight training. Training event modules should be developed so that training events are presented in a logical sequence. For example, missed approach training should be conducted in conjunction with approach training.

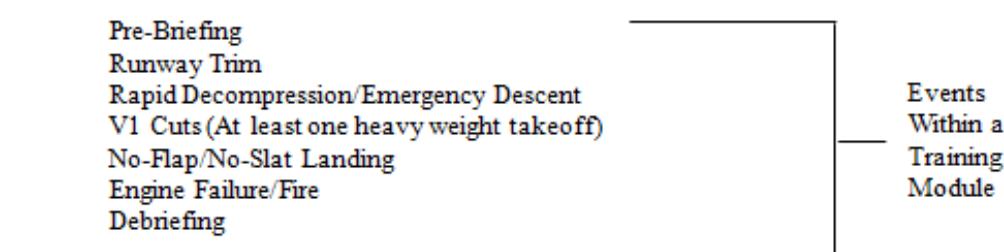
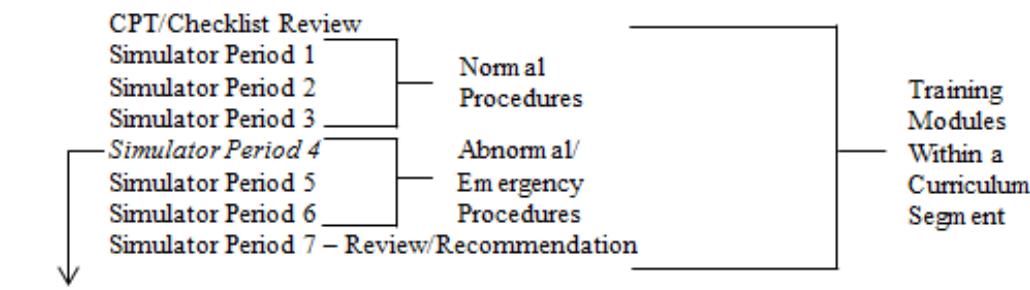
**E. Interrelationship Example.** Figure 4.21.6.1 illustrates the interrelationship of a curriculum segment and training modules when a modular format is used:

**Figure 4.21.6.1. Interrelationship of a Curriculum Segment and Training Modules—Modular Format**

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I. PIC B747 TRANSITION FLIGHT TRAINING (24 Training Hours)	Title of Curriculum and Specified Training Hours
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- A. Statement of training objective
- B. Training equipment (specify type/location)
- C. Maneuvers and procedures document (reference to manual)
- D. Training modules:



**4.21.6.9. TRAINING HOURS.** Flight training curriculum segments must specify a planned number of training hours. The operator's proposed number of training hours must realistically allow enough time for demonstration, instruction, and practice of the training events listed in the entire curriculum segment. A POI will not approve a proposed flight training curriculum segment unless the specified training hours realistically allow enough time to accomplish the required training events.

**A. Programmed Hours.** GACAR §§ 121.899 and 121.903 specify programmed hours of flight training for pilots and flight engineers (FE) enrolled in the initial new-hire and initial equipment categories of training.

**B. Training Hours.** GACAR §§ 121.919(d)(1) and (2) stipulate that programmed hours are not specified for pilot or FE recurrent flight training (RFT). However, if the flight training is conducted in an approved FFS, GACAR § 121.859(b)(1) requires at least four hours of training at the pilot controls for PIC and SIC training. Four hours of training are required regardless of

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whether the training is conducted on the events listed in Part 121, Appendix C, or the training is conducted under an approved Line-Oriented Flight Training (LOFT) program.

**C. Curriculum Segment Outlines.** GACAR Part 121 does not specify programmed hours for the other categories of training. GACAR Part 135 does not specify programmed hours for any of the categories of training. The number of training hours must be specified, however, on all flight training curriculum segment outlines. Because of the various situations that can be encountered, it is difficult to provide guidance on acceptable training hours for flight training curriculum segments. POIs must thoroughly study an operator's proposals. Based on experience with the operator, past experiences with other operators, as well as their own training experiences, POIs must use reasonable judgment when determining whether the training can be adequately accomplished within the training hours specified by the curriculum segment.

**D. Pilot Concurrent Training.** When flight training is conducted in a FSTD, it is acceptable and preferable for the flight training curriculum segment to be developed so that two pilots can be trained during a single flight training session. This includes the training of a PIC and SIC, two PICs, or two SICs at the same time. During this type of training, one pilot (pilot A) manipulates the controls of the aircraft while the other pilot (pilot B) performs the duties of the "pilot-not-flying" (PNF) the aircraft. During the same training session, the pilots reverse roles. Pilot B manipulates the controls, and pilot A performs the duties of the PNF. The duties of the PNF are typically included in the operator's aircraft operating manuals and/or in the maneuvers and procedures document. These duties include normal, abnormal, and emergency duties (that are performed by the PNF) and the crew participation activities (Crew Resource Management (CRM) concepts) used by the operator. Both pilots are receiving essential "crew-concept" training throughout the training session. Therefore, the total training hours accomplished during the training session can be credited to each of the participating pilots. For example, if a PIC and an SIC participated in a four-hour FSTD session, both pilots would receive four hours of training credit. This method of crediting training hours is valid only when both student pilots manipulate the controls for approximately equal amounts of time. This method of crediting training hours is not valid when the instructor is providing instruction and is also occupying one of the pilot seats of the FSTD or aircraft.

**E. LOFT Training Session.** Both recurrent and qualification LOFT training sessions should be based on at least four hours of total crew member training activity. When the guidance contained in FAA Advisory Circular (AC) 120-35C (as amended), Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational

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Evaluation is followed, all crew members who participate in a LOFT training session are credited with four hours of training time, as follows:

1) *Two Trainees.* Appropriate crew composition is central to the LOFT training concept. Acceptable scheduling practices and crew substitution allowances differ in recurrent LOFT and qualification LOFT. Refer to FAA AC 120-35 (as amended), for specific differences. When the crew consists of two PIC trainees or two SIC trainees, both pilots should receive full credit (four hours), provided the following conditions are met:

- The LOFT session conforms to the minimum four-hour format described in FAA AC 120-35
- At least 2 1/2 hours are spent in the LOFT scenario
- The pilots swap seats at approximately the midpoint in the LOFT flight segment

2) *One Trainee.* When only one trainee participates in qualification LOFT, that trainee should receive full credit (four hours), provided the following conditions are met:

- The LOFT session conforms to the minimum four-hour format described in FAA AC 120-35 (as amended)
- At least 2 1/2 hours are spent in the LOFT scenario (including spot)

**NOTE:** A two-hour qualification LOFT session for one pilot does not meet the training requirements of Part 121, Appendix D. A qualification LOFT program consists of at least a four-hour course of training for each flight crew.

### 4.21.6.11. COURSE COMPLETION REQUIREMENTS.

**A. Failure to Meet Requirements.** Ordinarily, a flight crew member completes a flight training curriculum segment by successfully accomplishing each training event and the specified number of training hours. Flight crew members are then required to successfully meet the requirements specified in the qualification curriculum segment (see Section 7 of this chapter) for the qualification curriculum segment requirements). If a person fails to meet any of the qualification requirements because of a lack in flight proficiency, that person must be returned to training status. After retraining, an instructor recommendation is required for re-accomplishing the

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unsatisfactory qualification requirement.

**B. Exceptions to Requirements.** A flight crew member may successfully complete a flight training curriculum segment without completing the specified number of training hours, provided all of the following conditions are met:

- 1) The crew member successfully completes all of the training events required by the curriculum segment.
- 2) An instructor recommends the flight test be conducted before completion of the specified number of training hours. The recommendation must be suitably documented.
- 3) The flight crew member satisfactorily completes the qualification curriculum segment requirements. If a flight crew member fails to meet the qualification curriculum segment requirements because of a lack in flight proficiency, he must be required to complete all the training hours specified in the flight training curriculum segment. The crew member must then be recommended by an instructor before re-accomplishing the failed qualification requirements.

### **4.21.6.13. EVALUATION OF FLIGHT TRAINING CURRICULUM SEGMENT OUTLINES**

**FOR INITIAL APPROVAL.** When evaluating a flight training proposal for initial approval, POI must determine that the proposed curriculum segment meets the following requirements:

**A. Maneuvers and Procedures Table.** The training events must be consistent with the maneuvers and procedures tables applicable to the specific category of training. A POI must select the appropriate maneuvers and procedures table and make a side-by-side comparison of the table and the proposed flight training curriculum segment. The required training events and the appropriate FSTD or aircraft to be used must be in the proposal. Omission of any required training event or inappropriate use of a FSTD is sufficient reason to deny initial approval.

**B. Realistic Training Hours.** The specified training hours are realistic, as discussed in paragraph 4.21.6.9.

**C. Examining Courseware.** The training emphasizes specific areas applicable to the category of training. Since flight training curriculum outlines are not usually constructed in a manner that allows for a determination that appropriate areas are emphasized, a POI must examine courseware (such as flight instructor guides and LOFT scenarios) to determine if appropriate areas will be

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emphasized and if the operator is capable of developing acceptable courseware. In the paragraphs preceding the applicable maneuvers and procedures tables in this section, training emphasis considerations for each category of flight training are discussed.

### **4.21.6.15. EVALUATING THE OPERATOR'S MANEUVERS AND PROCEDURES**

**DOCUMENT.** The operator must provide a maneuvers and procedures document for approval by the GACA. A POI must determine that this document provides detailed descriptions or pictorial displays for the normal, abnormal, and emergency maneuvers, including the procedures and functions that will be performed in flight training. Instructor guides or lesson plans which support the maneuvers and procedures document should specify the conditions (such as weather, aircraft mass, and other parameters) to be applied during training on a maneuver or procedure. The conditions specified in these guides or lesson plans should be equivalent to the types of operations authorized by the operations specifications, such as low visibility takeoffs or the use of Category I Approach (CAT I) or Category II Approach (CAT II) minimums. GACA policy requires detailed descriptions (or pictorial displays) of at least those training events identified with the symbol M in the appropriate maneuvers and procedures tables. Maneuvers and procedures documents must be evaluated in sufficient detail to ensure the following requirements are met:

- The description of each maneuver or procedure must conform to the operating limitations and procedures in the AFM or the operator's aircraft operating manual
- The description of each maneuver or procedure must conform to the operator's procedural instructions for cockpit checks, altitude awareness, required callouts, crew coordination, and cockpit resource management
- The description of each maneuver or procedure must specify the operator's procedures, such as altitudes, configuration airspeeds, and other parameters

**4.21.6.17. AIRCRAFT FAMILIES.** The families of aircraft used in GACAR Part 121 and Part 135 operations are described in Section 1, paragraph 4.21.1.3. The flight training requirements for flight crew members differ significantly between each family. Within each family, the flight training requirements are similar, even though individual aircraft may differ significantly in construction and appearance. The maneuvers and procedures tables have been tailored to account for similar flight crew member knowledge, skill, and ability requirements common to aircraft of a particular family and specific to different kinds of operations within a family.

#### **A. Transport Category Airplanes, Commuter Category Airplane and Turbojet Family and**

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**Turbopropeller Small Airplane Family (i.e. Turbine –Powered Airplanes).** Airplanes in these two families are all turbine-powered and are similar in operational characteristics. Crew members of airplanes in this family are required to have similar knowledge, skills, and abilities regardless of the applicable operating regulation. The maneuvers and procedures tables containing required training events for flight crew members operating aircraft in this family are in paragraphs 4.21.6.3 through 4.21.6.9 (see Tables 4.21.6.5 through 4.21.6.8).

**B. Multiengine Reciprocating-Powered Small Airplane Family.** Crew members of airplanes in this family are required to have similar knowledge, skills, and abilities when operating under GACAR Part 135. The flight training events required for flight crew members operating airplanes in this family are identified in the maneuvers and procedures table in paragraph 4.21.6.47 (see Table 4.21.6.9).

**C. Single-Engine Reciprocating-Powered Small Airplane Family.** Crew members of airplanes in this family are required to have similar knowledge, skills, and abilities to be operated under GACAR Part 135. The flight training events required for the operation of single-engine airplanes are identified in the maneuvers and procedures table in paragraph 4.21.6.49 (see Table 4.21.6.10).

**D. Rotorcraft Family.** Crew members operating rotorcraft under GACAR Part 135 are required to have similar knowledge, skills, and abilities. The flight training events required for flight crew members operating these rotorcraft are identified in the maneuvers and procedures table (Table 4.21.6.11). Until such time as specialized training requirements for transport category rotorcraft are established, Inspectors should also use this guidance for rotorcraft operations under GACAR Part 121.

**Note:** Table 4.21.6.11 is currently under development.

**4.21.6.19. FSTDs.** Flight training equipment consists of seven levels of FTDs, four levels of FFSs, and the aircraft. The approved use of each item of flight training equipment is listed in the maneuvers and procedures tables. These devices and simulators are the only types of flight training equipment (other than aircraft) which may be approved for use in an -approved flight training program. Before any level 1 through level 5 FTD can be used, it must be evaluated by the POI to determine that it meets the prescribed requirements for the appropriate level of FTD. Before a specific level 6 and 7 training device or any level FFS can be used, it must be evaluated and qualified in accordance with GACAR Part 60 and approved by the operator's POI. The following paragraphs describe the FSTDs applicable to Part 121 and 135 flight training. FAA AC 120-45 (as amended), Airplane Flight

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Training Device Qualification provides the qualification policy, and criteria, as well as more detailed technical descriptions of FSTDs. The functional descriptions in the following paragraphs provide only a brief overview. Therefore, the appropriate ACs may be the only authorized source documents and must be used for evaluation and approval of FSTDs.

**NOTE:** The functional and technical descriptions for the first three levels of FTDs are presently under development and are not applicable to Part 121 or Part 135 flight training.

### **4.21.6.21. LEVEL 4 FTD.**

**A. Purpose.** To permit learning, development, and the practice of skills and cockpit procedures necessary for understanding and operating the integrated systems of a specific aircraft.

**B. Functional Description.** A level 4 training device has the following characteristics and components:

- A replica of the flight deck panels, switches, controls, and instruments, in proper relationship, to represent the aircraft for which training is to be accomplished
- Systems indications which respond appropriately to switches and controls which are required to be installed for the training or checking to be accomplished
- Air/ground logic (however, simulated aerodynamic capabilities are not required)

### **4.21.6.23. LEVEL 5 FTD.**

**A. Purpose.** To permit learning, development, and the practice of skills, cockpit procedures, and instrument flight procedures necessary for understanding and operating the integrated systems of a specific aircraft in typical flight operations in real time.

**B. Functional Description.** A level 5 training device has the following characteristics and components:

- A replica of the flight deck panels, switches, controls, and instruments, in proper relationship, to represent the aircraft for which training is to be accomplished
- Systems indications which respond appropriately to switches and controls which are

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required to be installed for the training or checking to be accomplished

- Simulated aerodynamic capabilities representative of the aircraft group or class
- Functional flight and navigational controls, displays, and instrumentation
- Control forces and control travel of sufficient precision for manually flying an instrument approach

### **4.21.6.25. LEVEL 6 FTD.**

#### **A. Purpose.**

- 1) To permit learning, development, and the practice of skills in cockpit procedures, instrument flight procedures, certain symmetrical maneuvers and flight characteristics necessary for operating the integrated systems of a specific aircraft in typical flight operations.
- 2) To permit the use of previously approved nonvisual simulators and the continued use of level 6 and 7 FTDs (formerly known as advanced training devices) for those Part 135 operators approved to use them.

#### **B. Functional Description.** A level 6 training device has the following characteristics and components:

- Systems indications which respond appropriately to switches and controls which are required to be installed
- A replica of the cockpit of the aircraft for which training is to be accomplished
- Simulated aerodynamic capabilities which closely represent the specific aircraft in ground and flight operations
- Functional flight and navigational controls, displays, and instrumentation
- Control forces and control travel which correspond to the aircraft
- Instructor controls

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### 4.21.6.27. LEVEL 7 FTD.

**A. Purpose.** To permit learning, development, and the practice of skills in cockpit procedures, instrument flight procedures and maneuvers, and flight characteristics necessary for operating the integrated systems of a specific aircraft in typical flight operations.

**B. Functional Description.** A level 7 training device has the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- A full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic and ground dynamic characteristics of the aircraft being simulated
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter
- Control forces, dynamics, and travel which correspond to the aircraft; and
- Instructor controls and seat

### 4.21.6.29. LEVEL A FFS.

**A. Purpose.** To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level A FFSs may be used for specified pilot recency of experience requirements and specified flight operational task training requirements in transition, upgrade, recurrent, and requalification training under parts 121 and 135. It may also be used for initial new-hire and initial equipment training on specified events.

**NOTE:** Level A FFSs comply with the technical standards specified for basic (visual)

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simulators in FAA AC 120-45 (as amended).

**B. Functional Description.** Level A FFSs have the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- A full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic characteristics of the aircraft being simulated
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter
- Control forces and travel which correspond to the aircraft
- Instructor controls and seat
- At least a night visual system with the minimum of a 45 degree horizontal by 30 degree vertical field of view (FOV) for each pilot station
- A motion system with at least three degrees of freedom

### 4.21.6.31. LEVEL B FFS.

**A. Purpose.** To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level B FFSs may be used for pilot recency of experience requirements and for specified flight operational task training requirements in transition, upgrade, recurrent, and requalification training under Part 121 and 135. It may also be used for initial new-hire and initial equipment training on specified events. Level B FFS may also be used to accomplish night takeoffs and landings and for landings in a proficiency check.

**NOTE:** Level B FFSs comply with the technical standards specified for Phase I simulators

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in Part 121, Appendix D and FAA AC 120-45 (as amended).

**B. Functional Description.** A Level B FFSs has the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- A full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter
- Control forces and travel which correspond to the aircraft
- Instructor controls and seat
- At least a night visual system with a minimum of a 45 degree horizontal by 30 degree vertical FOV for each pilot station
- A motion system with at least three degrees of freedom

### 4.21.6.33. LEVEL C FFS.

**A. Purpose.** To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level C FFSs may be used for pilot recency of experience requirements and for specified flight operational task training in transition, upgrade, recurrent, and requalification training under GACAR Part 121 and 135. It may also be used for initial new-hire and initial equipment training for all events. All training events may be conducted in a level C FFS for persons who have previously qualified as PIC or SIC with that operator.

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**NOTE:** Level C FFSs comply with the technical standards specified for Phase II simulators in Part 121, Appendix D and FAA AC 120-45 (as amended).

**B. Functional Description.** Level C FFS have at least the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- A full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic including ground effect, and ground dynamic characteristics of the aircraft being simulated
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter
- Control forces, dynamics, and travel which correspond to the aircraft
- Instructor controls and seat
- At least a night and dusk visual system with a minimum of a 75 degree horizontal by 30 degree vertical FOV for each pilot station
- A motion system with at least six degrees of freedom

### 4.21.6.35. LEVEL D FFS.

**A. Purpose.** To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level D FFSs may be used for Part 121 and 135 pilot currency and for all flight operational task training except for static aircraft training.

**NOTE:** Level D FFS comply with the technical standards specified for Phase III simulators

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in Part 121, Appendix D and the current edition of FAA AC 120-45.

**B. Functional Description.** Level D FFSs have the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated
- A full-scale replica of the cockpit of the aircraft being simulated
- Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated
- Correct simulation of selected environmentally affected aerodynamic and ground dynamic characteristics of the aircraft being simulated considering the full range of its flight envelope in all approved configurations
- Correct and realistic simulation of the effects of environmental conditions which the aircraft might encounter
- Control forces, dynamics, and travel which correspond to the aircraft;
- Instructor controls and seat
- A daylight, dusk, and night visual system with the minimum of a 75 degree horizontal by 30 degree vertical FOV for each pilot station
- A motion system with at least 6 degrees of freedom

### 4.21.6.37. MANEUVERS AND PROCEDURES TABLES.

**A. Compliance.** The events which must be accomplished during flight training are listed in the maneuvers and procedures tables in this section. The requirements of GACAR Part 121 and 135 are included in these tables. These tables can be used as a single source document in the development and evaluation of flight training curriculum segment proposals. Compliance with

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the provisions of these tables automatically ensures that all requirements of both GACAR Part 121 and 135 are met. These tables also contain the acceptable flight training equipment (FSTD or aircraft) which may be used for any training event. An “X” indicates that the specified FTD or FSS has been qualified for that event without further consideration or approval. An “A” indicates that a lower level device or simulator may be used for procedural training if that device has the necessary systems representations and functions for training on the event. These systems representations and functions exceed the basic requirements for that level device or simulator; therefore, an “A” indicates that the device or simulator must be evaluated and approved for each particular event. Any maneuver or procedure permitted in a specific level of FTD or FSS may also be conducted in a higher level of FTD, FSS or the aircraft itself (providing the event can safely be accomplished in the aircraft). Certain training events within the tables are preceded with a box ([ ]). If the operator is authorized (or required) to conduct these maneuvers by operations specifications (OpSpecs) (for example, a circling approach), the POI should check the appropriate box to indicate these events must be included in the training curriculum. Certain optional training events indicated by a pound sign (#) in the maneuvers and procedures tables are not specifically required by the regulations or OpSpecs. Many of these optional training events, however, are often included in an operator’s flight training curriculums and should be conducted in a properly qualified device or simulator.

**NOTE:** See paragraph 4.21.6.15 for description of maneuvers marked with the letter (M).

**B. Wind Shear Training.** Wind shear training is a training event in each table. The tables indicate that wind shear training may only be performed in a level 7 FTD or any level of FSS.

**C. Requirements Paragraph.** Preceding each maneuver and procedure table is a paragraph which states the required maneuvers and procedures for each crew member and provides guidance on specific areas of emphasis which should be included in the training.

### **4.21.6.39. PIC/SIC INITIAL NEW-HIRE AND INITIAL EQUIPMENT FLIGHT TRAINING—ALL TURBINE-POWERED AIRCRAFT**

**A. Required Maneuvers and Procedures.** Training in the maneuvers and procedures in Table 4.21.6.5 must be conducted for satisfactory completion of initial new-hire and initial equipment flight training.

- 1) PICs must complete training in each training event in this table.

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2) SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize duties of the PNF:

- Steep turns
- Approach and landing with pitch mis-trim
- Approach and landing with 50 percent loss of power
- Approach and landing with flap/slat malfunction

**B. Training Emphasis Considerations.** POIs should ensure that the operator's flight training emphasizes appropriate areas for these categories of training:

- 1) For initial new-hire training, emphasis should be on specific company procedures and procedures for the particular aircraft.
- 2) For initial equipment training, emphasis should be on company procedures specific to the aircraft.

**Table 4.21.6.5. Flight Training PIC/SIC Initial New-Hire and Initial Equipment Flight Training - Turbine-Powered Airplanes**

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FTD				LEVEL OF FSS				A C F T
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PREPARATION	Visual Inspection (For aircraft with FE, use of pictorial display authorized)									X
	Prestart Procedures	A	A	X	X	X	X	X	X	
	Performance Limitations	X	X	X	X	X	X	X	X	
SURFACE OPERATION	Pushback			X	X	X	X	X	X	X
	[ ] Powerback Taxi							X	X	X
	Starting	A	A	X	X	X	X	X	X	X
	Taxi/Runway Operations							X	X	X
	Pre-takeoff Checks	A	A	X	X	X	X	X	X	X
TAKEOFF	Normal M							X	X	X
	Crosswind							X	X	X
	Rejected M			X	X	X	X	X	X	X
	Power Failure V1 M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[ ] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X	X	X	X	X	X	X
	One-engine Inoperative During Climb to En Route Altitude #					X	X	X	X	X
EN-ROUTE	Steep Turns PIC			X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first stall indication			X*	X*	X	X	X	X	X
	Inflight Powerplant Shutdown	A	A	X	X	X	X	X	X	X
	Inflight Powerplant Restart	A	X	X	X	X	X	X	X	X
	High Speed Handling Characteristics					X	X	X	X	X

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<b>DESCENT</b>	Normal		X	X	X	X	X	X	X
	Maximum Rate				X	X	X	X	X
<b>APPROACHES</b>	VFR Procedures M						X	X	X
	Visual Approach								
	With 50 percent Loss of Power on one-side PIC M (2-engines inoperative on 3-engine airplanes) A* (May be accomplished in levels A or B provided one-engine inoperative training is conducted in level C or D, or the aircraft)				A*	A*	X	X	X
	With Slat/Flap Malfunction PIC M				X	X	X	X	X
	IFR Precision Approaches M ILS/Normal						X	X	X
	ILS/One-Engine Inoperative						X	X	X
	[ ] PAR/Normal				X	X	X	X	X
	[ ] PAR/One-Engine Inoperative #				X	X	X	X	X
	IFR Non-precision Approaches M NDB/Normal		A*	A*	X	X	X	X	X
	VOR/Normal A* Atleast one Non-precision approach must be accomplished in a level A or higher FFS or the aircraft		A*	A*	X	X	X	X	X
	Non-precision Approach One-Engine Inoperative #	A	X	X	X	X	X	X	X
	[ ] LOC Backcourse Procedures	A	X	X	X	X	X	X	X
	[ ] ASR Procedures	A	X	X	X	X	X	X	X
	[ ] RNAV Procedures	A	X	X	X	X	X	X	X

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<b>APPROACHES (Cont'd)</b>	[ ] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)						X	X	X
	Missing Approaches M From Precision Approach			X	X	X	X	X	
	From Non-precision Approach			X	X	X	X	X	
	With Powerplant Failure			X	X	X	X	X	
	NOTE: At least one MAP must be a complete approved procedure. At least one MAP must be with a powerplant failure								
<b>LANDINGS</b>	Normal						X	X	X
	With Pitch Miss-trim PIC						X	X	X
	From Precision Instrument Approach						X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative						X	X	X
	With 50 percent Loss of Power on One Side PIC (2-engines inoperative on 3-engine airplanes) A* (May be accomplished in Levels A or B, provided one-engine inoperative training is conducted in level C or D, or the aircraft.)			A*	A*	X	X	X	
	With Flap/Slat Malfunction			X	X	X	X	X	
	Crosswind					X	X	X	
	With Manual Reversion/Degraded Control Augmentation			X	X	X	X	X	
	Parking #						X	X	X
	Emergency Evacuation #		X	X	X	X	X	X	X
<b>OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE</b>	Holding	X	X	X	X	X	X	X	X
	Ice Accumulation on Airframe #		X	X	X	X	X	X	X
	Air Hazard Avoidance #			A	A	X	X	X	

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	Windshear/Microburst #									
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>	Pneumatic/Pressurization	A	A	X	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X	X
	Hydraulic	A	A	X	X	X	X	X	X	X
	Flight Controls	A	A	X	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X	X
	Autopilot (AP)		A	X	X	X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X	X	X	X	X	X	X
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>	Airborne Weather Radar	A	A	X	X	X	X	X	X	X
	Flight Instrument System Malfunction		A	X	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X	X
	Aircraft Fires	A	A	X	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X	X
	Powerplant Malfunctions	A	A	X	X	X	X	X	X	X
<b>Emergency</b>	Fuel Jettison	A	A	X	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X	X

**4.21.6.41. PIC/SIC TRANSITION AND UPGRADE FLIGHT TRAINING – TURBINE-POWERED AIRPLANES.**

**A. Required Maneuvers and Procedures.** Training in the maneuvers and procedures in Table 4.21.6.6 must be conducted for satisfactory completion of transition or upgrade flight training.

- 1) *PIC Transition Training.* PICs must complete training in each training event in this table.

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2) *SIC Transition Training.* SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary flight controls but should emphasize the duties of the PNF:

- Approach and landing with pitch mis-trim
- Approach and landing with 50 percent loss of power
- Approach and landing with flap/slat malfunction
- Steep turns

3) *PIC Upgrade Training.* An SIC upgrading to PIC must complete training in each training event in this table (including those marked “PIC”).

4) *GACAR Part 121, Appendix D SIC-to-PIC Initial Equipment Training.* GACAR Part 121, Appendix D—Phase II, Training and Checking Permitted—permits certain SICs to be trained as PICs in a different aircraft of the same group, if the training is conducted in a level C FSS. Because of the experience levels required in appendix D for SICs in this type of training (which is actually initial equipment training) the training may be accomplished in the same manner as PIC upgrade training.

5) *SIC Upgrade Training.* FEs upgrading to SIC must complete training in each training event in Table 4.21.6.6. FEs upgrading to SIC are not required to manipulate the primary flight controls for the following events, but should receive training which emphasizes duties of the PNF. The training events are as follows:

- Steep turns
- Approach and landing with pitch miss-trim
- Approach and landing with 50 percent loss of power
- Approach and landing with flap/slat malfunction

**B. Training Emphasis Considerations.** POIs should ensure that the operator’s transition and upgrade training emphasizes the appropriate areas for these categories of training:

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- 1) For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type.
- 2) For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the crew member position. Additionally, in the case of an FE upgrading to SIC, maneuver-emphasis training (particularly in approaches and landings) should be included.

**Table 4.21.6.6. Flight Training PIC/SIC Transition and Upgrade Flight Training— Turbine-Powered Airplanes**

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FTD				LEVEL OF FFS				A C F T
		4	5	6	7	A	B	C	D	
		VIS	PH I	PH II	PH III					
PREPARATION	Visual Inspection (For aircraft with FE, use of pictorial display authorized)									X
	Prestart Procedures	A	A	X	X	X	X	X	X	X
	Performance Limitations	X	X	X	X	X	X	X	X	X
SURFACE OPERATION	Pushback			X	X	X	X	X	X	X
	[ ] Powerback Taxi						X	X	X	X
	Starting	A	A	X	X	X	X	X	X	X
	Taxi						X	X	X	X
	Pre-takeoff Checks	A	A	X	X	X	X	X	X	X
TAKEOFF	Nominal M							X	X	X
	Crosswind							X	X	X
	Rejected M			X	X	X	X	X	X	X
	Power Failure V1 M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[ ] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X	X	X	X	X	X	X
	One-engine Inoperative During Climb to En Route Altitude #					X	X	X	X	X
EN-ROUTE	Steep Turns PIC			X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first stall indication		X*	X*	X	X	X	X	X	X
	Inflight Powerplant Shutdown	A	A	X	X	X	X	X	X	X
	Inflight Powerplant Restart		A	X	X	X	X	X	X	X
	High Speed Handling Characteristics					X	X	X	X	X
DESCENT	Normal			X	X	X	X	X	X	X

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	Maximum Rate					X	X	X	X	X
<b>APPROACHES</b>	VFR Procedures M							X	X	X
	Visual Approach								X	X
	With 50 percent Loss of Power on One side PIC M (2-engines inoperative on 3-engine airplanes)					X	X	X	X	X
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M ILS/Normal							X	X	X
	ILS/One-Engine Inoperative					X	X	X	X	X
	[ ] PAR/Nominal		X	X	X	X	X	X	X	X
	[ ] PAR/One-Engine Inoperative #				X	X	X	X	X	X
	IFR Non-precision Approaches M NDB/Normal	A *	A*	X	X	X	X	X	X	X
	VOR/Normal A* At least one Non-precision approach must be accomplished in a level A or higher FFS or the aircraft		A *	A*	X	X	X	X	X	X
	Non-precision Approach One-Engine Inoperative #				X	X	X	X	X	X
	[ ] LOC Backcourse Procedures	A	X	X	X	X	X	X	X	X
	[ ] ASR Procedures	A	X	X	X	X	X	X	X	X
	[ ] RNAV Procedures	A	X	X	X	X	X	X	X	X

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<b>APPROACHES</b> (Cont'd)	Missing Approaches M				X	X	X	X	X
	From Precision Approach								
	From Non-precision Approach				X	X	X	X	X
	With Powerplant Failure				X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure. At least one MAP must be with a powerplant failure								
<b>LANDINGS</b>	Normal						X	X	X
	With Pitch Miss-trim PIC				X	X	X	X	X
	From Precision Instrument Approach						X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative						X	X	X
	With 50 percent Loss of Power on One Side PIC (2-engines inoperative on 3-engine airplanes)				X	X	X	X	X
	With Flap/Slat Malfunction				X	X	X	X	X
	Crosswind						X	X	X
	With Manual Reversion/Degraded Control Augmentation				X	X	X	X	X
<b>AFTER LANDING</b>	Parking #						X	X	X
	Emergency Evacuation #		X	X	X	X	X	X	X
<b>OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE</b>	Holding		X	X	X	X	X	X	X
	Ice Accumulation on Airframe #		X	X	X	X	X	X	X
	Air Hazard Avoidance #			A	A	X	X	X	X

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	Windshear/Microburst #									
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>	Pneumatic/Pressurization	A	A	X	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X	X
	Hydraulic	A	A	X	X	X	X	X	X	X
	Flight Controls	A	A	X	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X	X
	Autopilot		A	X	X	X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X	X	X	X	X	X	X
	Airborne Weather Radar	A	A	X	X	X	X	X	X	X
	Flight Instrument System Malfunction		A	X	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X	X
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>	Aircraft Fires	A	A	X	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X	X
	Powerplant Malfunctions	A	A	X	X	X	X	X	X	X
	Fuel Jettison	A	A	X	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X	X

**4.21.6.43. PIC/SIC RECURRENT FLIGHT TRAINING (RFT) – TURBINE-POWERED AIRPLANES.**

**A. Required Maneuvers and Procedures.** Training in the maneuvers and procedures in Table 4.21.6.7, in accordance with the following paragraphs, must be conducted for the satisfactory completion of RFT.

- 1) *GACAR Part 121 RFT.* Part 121 RFT is training that must be conducted for PICs once every 6 months and for SICs once every 12 months, and must include training on the

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maneuvers and procedures listed in Appendix C of Part 121. Levels B, C, and D FFSs qualify for “training and checking to proficiency” on all the maneuvers and procedures required for RFT by Part 121. RFT can always be conducted in an airplane. A proficiency check (GACAR § 121.797) may be substituted for RFT.

2) *GACAR Part 121 Level A RFT.* Level A RFT is conducted in a visual simulator. Level A RFT is referenced in several different ways in Part 121. The following are examples: “A course of training in a FFS” (GACAR § 121.859(b)); “flight training in an approved FFS” (GACAR § 121.919(d)(1)); and “completed the following checks or FSTD training” (GACAR § 121.797(a)). For the purpose of standardization and mutual understanding, the term “level A recurrent flight training” or “level A RFT” should be used in reference to this type of training when it is conducted entirely in a visual simulator. Level A FFS are not qualified to be used for “training to proficiency” on certain maneuvers listed in Appendix C (such as takeoffs and landings). However, level A FFS can be used for training and practice on the procedures used to accomplish these maneuvers. These maneuvers are annotated by a “C” in the RFT maneuvers and procedures table (Table 4.21.6.7). Level A RFT may be substituted for alternate periods of RFT (required by GACAR § 121.835(c)(2)) or for alternate proficiency checks (required by GACAR § 121.797), provided the person being trained is evaluated by a check pilot during the subsequent proficiency check (for PICs once each 12 months; for SICs once each 24 months). The proficiency check may be conducted in a level A (visual) FFS, provided the person being checked is evaluated during the conduct of two landings on the line (or other check) by a check pilot (or, for SICs, by a line PIC). The entire proficiency check (without the landings on the line requirement) may be conducted in a level B, C, or D FFS.

3) *GACAR Part 121 Requalification Flight Training.* Requalification flight training is conducted specifically to restore a previously line qualified crew member to line qualified status. To be eligible for this training, a crew member must have previously been qualified in the specific aircraft type and duty position and have subsequently lost his/her qualification.

**B. Training Emphasis Considerations.** Operators should develop RFT and level A RFT curriculum segments which serve to maximize training on certain maneuvers and procedures. An airman’s competency to function in his assigned duty position is evaluated during an annual proficiency check (or a competency check). During that check, at least the events required by GACAR Part 121, Appendix C and any of the events required for the original issuance of the particular pilot certificate involved must be accomplished. The RFT curriculum outline should

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address all the required training events listed in Table 4.21.6.7. However, during RFT or level A RFT, specific training on every event is unnecessary unless it is needed for maintaining pilot proficiency on particular events. During periods of RFT or level A RFT training, emphasis should be on those events or other maneuvers or procedures not normally encountered during routine line operations, such as abnormal or emergency procedure training or windshear training. Additionally, training on new or revised maneuvers or procedures, new equipment, or other similar areas is ideally suited for periods of RFT or level A RFT. Time should be allotted to conduct training in maneuvers or procedures the airman wishes to practice, or in certain operational areas in which deficiencies have surfaced during proficiency or line checks, indicating a need for additional training.

**NOTE:** Even though all of the maneuvers and procedures may not be accomplished during RFT or level A RFT, the RFT curriculum segment outline should address all of the required training events listed in Table 4.21.6.7.

**Table 4.21.6.7. Flight Training PIC/SIC Recurrent and Requalification Flight Training - Turbine-Powered Airplanes**

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FTD				LEVEL OF FFS				A C F T
		4	5	6	7	A VIS	B PH I	C PH II	D P H II I	
PREPARATION	Visual Inspection (Use of pictorial display authorized)									X
	Pre-taxi Procedures		X	X	X	X	X	X	X	X
	Performance Limitations	A	A	X	X	X	X	X	X	X
SURFACE OPERATION	Pushback	A	A	X	X	X	X	X	X	X
	[ ] Powerback Taxi					X	X	X	X	X
	Starting			X	X	X	X	X	X	X
	Taxi					C	C	X	X	X
	Pre-takeoff Checks	A	A	X	X	X	X	X	X	X
TAKEOFF	Normal M					C	C	X	X	X
	Crosswind					C	C	X	X	X
	Rejected M			X	X	X	X	X	X	X
	Power Failure V1 M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[ ] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X	X	X	X	X	X	X
	One-engine Inoperative During Climb to En Route Altitude #				X	X	X	X	X	X
EN-ROUTE	Steep Turns PIC			X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first stall indication		X *	X *	X	X	X	X	X	X
	Inflight Powerplant Shutdown	A	A	X	X	X	X	X	X	X
	Inflight Powerplant Restart		A	X	X	X	X	X	X	X
	High Speed Handling Characteristics					X	X	X	X	X
DESCENT	Normal			X	X	X	X	X	X	X

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	Maximum Rate			X	X	X	X	X	X	X
<b>APPROACHES</b>	VFR Procedures M Visual Approach				C	X	X	X	X	X
	With 50 percent Loss of Power on One side PIC M (2-engines inoperative on 3-engine airplanes)				X	X	X	X	X	X
	With Slat/Flap Malfunction PIC M				X	X	X	X	X	X
	IFR Precision Approaches M ILS/Normal			X	X	X	X	X	X	X
	ILS/One-Engine Inoperative				C	X	X	X	X	X
	[ ] PAR/Normal		X	X	X	X	X	X	X	X
	[ ] PAR/One-Engine Inoperative #				X	X	X	X	X	X
	IFR Non-precision Approaches M NDB/Normal		A *	A *	X	X	X	X	X	X
	VOR/Normal A* At least one Non-precision approach must be accomplished in a level A or higher FFS or the aircraft		A *	A *	X	X	X	X	X	X
	Non-precision Approach One-Engine Inoperative #				X	X	X	X	X	X
	[ ] LOC Backcourse Procedures	A	X	X	X	X	X	X	X	X
	[ ] ASR Procedures	A	X	X	X	X	X	X	X	X
	[ ] RNAV Procedures	A	X	X	X	X	X	X	X	X
	[ ] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)				X	X	X	X	X	X

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<b>APPROACHES (Cont'd)</b>	Missing Approaches M				X	X	X	X	X
	From Precision Approach				X	X	X	X	X
	From Non-precision Approach				X	X	X	X	X
	With Powerplant Failure				X	X	X	X	X
<b>LANDINGS</b>	Normal				C	X	X	X	X
	With Pitch Miss-trim PIC				C	X	X	X	X
	From Precision Instrument Approach				X	X	X	X	X
	From Precision Instrument Approach				X	X	X	X	X
	With Most Critical Engine Inoperative				X	X	X	X	X
	With 50 percent Loss of Power on One Side PIC (2-engines inoperative on 3-engine airplanes)				X	X	X	X	X
<b>AFTER LANDING</b>	Crosswind				A	X	X	X	X
	Parking #				X	X	X	X	X
	Emergency Evacuation #				X	X	X	X	X
<b>OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE</b>	Holding				X	X	X	X	X
	Ice Accumulation on Airframe #				X	X	X	X	X
	Air Hazard Avoidance #				A	X	X	X	X
	Windshear/Microburst #				X	X	X	X	X
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>  <b>-Normal</b> <b>-Abnormal</b> <b>-Alternate</b>	Pneumatic/Pressurization	A	A	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X
	Hydraulic	A	A	X	X	X	X	X	X
	Flight Controls	A	A	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X
	Autopilot			X	X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X	X	X	X	X	X
	Airborne Weather Radar	A	A	X	X	X	X	X	X
	Flight Instrument System Malfunction	A	A	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X

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<b>SYSTEMS</b>	Aircraft Fires	A	A	X	X	X	X	X	X	X
<b>PROCEDURES</b>	Smoke Control	A	A	X	X	X	X	X	X	X
<b>TRAINING</b>	Powerplant Malfunctions	A	A	X	X	X	X	X	X	X
<b>DURING ANY</b>	Fuel Jettison	A	A	X	X	X	X	X	X	X
<b>PHASE</b>	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X	X
<b>-Emergency</b>	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X	X

### 4.21.6.45. FE INITIAL EQUIPMENT, INITIAL NEW-HIRE, TRANSITION, AND RFT - TRANSPORT CATEGORY AIRPLANES.

**A. Initial Issuance of an FE Certificate.** All applicants for an FE certificate with the initial class rating must have completed one of the following:

- Completed an approved flight engineer certificate training program of an air operator conducting operations under GACAR Part 121
- Have received a certificate of graduation from an approved flight engineer training program under GACAR Part 143 applicable to the aircraft category and class rating sought

1) *Knowledge Testing.* A person must train and practice in procedures related to the carrying out of flight engineer duties and functions. This training and practice may be accomplished either in flight or in an FSTD. In addition, they must pass the required knowledge test on the aeronautical knowledge areas listed in GACAR Part 143

2) *Practical Testing.* A person must pass the required practical test on the areas of operation listed in GACAR Part 143, Appendix C that apply to the aircraft category and class rating sought. The flight check must include:

- Preflight inspection
- In-flight performance of assigned duties accomplished from the flight engineer station during taxi, run-up, takeoff, climb, cruise, descent, approach, and landing
- Accomplishment of other functions, such as fuel management and preparation of fuel consumption records, and normal and emergency or alternate operation of all aircraft

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flight systems, performed either in flight or in an FSTD

3) *Programed Hours.* Per GACAR §§ 121.899(c) and 121.903, the initial flight training must include at least the following programmed hours of in-flight training and practice unless reduced under GACAR § 121.851:

- Turbopropeller-powered airplanes - 7 hours
- Turbojet-powered airplanes - 10 hours

**NOTE:** The programmed hours of flight training contained in GACAR Part 121 do not apply if the training program for the aircraft type includes a course of flight engineer training in an FSTD as provided in GACAR § 121.903(d).

4) *Use of a FSTD.* If the Part 121 operators approved training program includes a course of training using an FSTD under GACAR § 121.859(c), each flight engineer must successfully complete in an FSTD:

- Training and practice in at least all of the assigned duties, procedures, and functions required by Initial or transition flight training
- A flight check to an appropriate level of proficiency in the assigned duties, procedures, and functions

5) *Prior Experience.* Flight engineers possessing a commercial pilot certificate with an instrument, aircraft category and class rating, or pilots already qualified as SIC and reverting to flight engineer, may complete the entire flight check in an approved FFS.

**B. FE Transition Flight Training.** An FE employed by a GACAR Part 121 operator who transitions from one airplane to another must complete a transition flight training curriculum segment approved under PGACAR art 121. The use of FSTDs or aircraft, for accomplishing training events must be proposed by the operator and approved by the POI.

### C. Recurrent Training.

1) *Ground Training.* Recurrent ground training must consist of at least the following programmed hours unless reduced under GACAR § 121.851:

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- Turbopropeller-powered airplanes - 20 hours
- Turbojet-powered airplanes - 25 hours

2) *Flight Training.* Recurrent flight training as provided by GACAR § 121.903(a) except as follows:

- The specified number of in-flight hours is not required
- The flight check, other than the preflight inspection, may be conducted in an FSTD. The preflight inspection may be conducted in an aircraft, or by using a pictorial means that realistically portrays the location and detail of preflight inspection items and provides for the portrayal of abnormal conditions. Satisfactory completion of an approved line oriented simulator-training program may be substituted for the flight check.

**D. Required Maneuvers and Procedures.** Training in the maneuvers and procedures in Table 4.21.6.8 must be conducted for satisfactory completion of initial new-hire, initial equipment, and transition or recurrent training, for previously certificated FEs and for the initial certification of FEs. Training for these maneuvers and procedures must include training in normal, abnormal, alternate, and emergency procedures, as appropriate.

**E. Training Emphasis Considerations.** A POI should ensure that the operator's FE flight training emphasizes the appropriate areas for these categories of training:

- 1) For initial new-hire training, emphasis should be on areas involving crew concept, duties, responsibilities, systems integration concepts, and company procedures.
- 2) For transition and initial equipment training, emphasis should be on the systems and procedures that pertain to the specific aircraft type.
- 3) For recurrent training, emphasis should be on new or revised maneuvers or procedures that are pertinent to line operations.

**Table 4.21.6.8. Flight Training FE Initial Equipment, Initial New-Hire, Transition and Recurrent Flight Training**

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FTD				LEVEL OF FFS				A C F T
		4	5	6	7	A	B	C	D	
		VIS	PH I	PH II	PH III					
<b>PREPARATION</b>	Airplane Preflight • Logbook Procedures • Safety Checks (PICTORIAL DISPLAY) • Cabin\Interior • Exterior Walk Around • Servicing/Deicing • Use of Oxygen	X	X	X	X	X	X	X	X	X
<b>GROUND OPERATIONS</b>	Performance Data • T/O LND Data • Aerodrome Analysis • Mass and Balance (M&B)	X	X	X	X	X	X	X	X	X
	Use of Checklist • Panel Setup	X	X	X	X	X	X	X	X	X
	Starting • External PWR • External Air • APU	X	X	X	X	X	X	X	X	X
	Communications • Station Procedures • ACARS	X	X	X	X	X	X	X	X	X
	Taxi	X	X	X	X	X	X	X	X	X
<b>TAKEOFF</b>	Powerplant Control		X	X	X	X	X	X	X	X
	Flaps/Landing Gear		X	X	X	X	X	X	X	X
	Fuel Management	X	X	X	X	X	X	X	X	X
	Other Systems Operation	X	X	X	X	X	X	X	X	X
	Aircraft Performance	X	X	X	X	X	X	X	X	X
	Checklist Completion	X	X	X	X	X	X	X	X	X
<b>CLIMB</b>	Powerplant Control		X	X	X	X	X	X	X	X
	Fuel Management	X	X	X	X	X	X	X	X	X
	Pressurization		X	X	X	X	X	X	X	X
	Electrical System	X	X	X	X	X	X	X	X	X
	Air Conditioning		X	X	X	X	X	X	X	X
	Flight Controls	X	X	X	X	X	X	X	X	X
	Other Systems	X	X	X	X	X	X	X	X	X
<b>EN-ROUTE</b>	Powerplant Operation		X	X	X	X	X	X	X	X
	Fuel Management	X	X	X	X	X	X	X	X	X

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	Performance Management		X	X	X	X	X	X	X	X
	High Altitude Performance		X	X	X	X	X	X	X	X
	Other Systems Operation	X	X	X	X	X	X	X	X	X
DESCENT	Powerplant Operation		X	X	X	X	X	X	X	X
	Other Systems Operations	X	X	X	X	X	X	X	X	X
	Performance Management	X	X	X	X	X	X	X	X	X
APPROACH	Landing Data	X	X	X	X	X	X	X	X	X
	Landing Gear Operation	X	X	X	X	X	X	X	X	X
	Flap/Slat/Spoiler Operation		X	X	X	X	X	X	X	X
	Approach Monitoring M		X	X	X	X	X	X	X	X
LANDINGS	Powerplant Operation		X	X	X	X	X	X	X	X
	Aircraft Configuration		X	X	X	X	X	X	X	X
	System Operation	X	X	X	X	X	X	X	X	X
	Emergency Evacuation			X	X	X	X	X	X	X
PROCEDURES DURING ANY GROUND OR AIRBORNE PHASE  - Normal - Abnormal - Alternate - Emergency	Cockpit Equipment			X	X	X	X	X	X	X
	Flap/Slats/Gear		X	X	X	X	X	X	X	X
	Powerplant		X	X	X	X	X	X	X	X
	Pressurization		X	X	X	X	X	X	X	X
	Pneumatic	X	X	X	X	X	X	X	X	X
	Air Conditioning	X	X	X	X	X	X	X	X	X
	Fuel and Oil	X	X	X	X	X	X	X	X	X
	Electrical	X	X	X	X	X	X	X	X	X
	Hydraulic	X	X	X	X	X	X	X	X	X
	Flight Controls		X	X	X	X	X	X	X	X
	Anti-Icing & Deicing		X	X	X	X	X	X	X	X

**4.21.6.47. PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES)—MULTIENGINE RECEIPIROCATING-POWERED SMALL AIRPLANES.**

**A. Required Maneuvers and Procedures.** Training in the maneuvers and procedures Table 4.21.6.9 must be conducted for satisfactory completion of each category of flight training. Those training events annotated with an “SEA” symbol are only required for those operators engaged in seaplane operations.

- 1) PICs must complete training in each training event in this table.
- 2) SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should

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emphasize duties of the PNF:

- Approach and landing with pitch miss-trim
- Approach and landing with 50 percent loss of power on one side
- Approach and landing with flap/slat malfunction
- Steep turns

**B. Training Emphasis Considerations.** A POI should ensure that the operator's flight training emphasizes the appropriate areas for these categories of training:

- 1) For initial new-hire training, emphasis should be on specific company procedures.
- 2) For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type.
- 3) For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the crew member position.
- 4) For recurrent training, emphasis should be on new or revised maneuvers or procedures pertinent to line operations.

**C. Part 135 RFT.** RFT must be conducted periodically for both PICs and SICs, at least once every 12 months. GACAR § 135.409(c) specifies that RFT for pilots must include at least "...flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by GACAR § 135.349 (the competency check)...may be substituted for recurrent flight training." The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate for the category, class, and type of aircraft involved. The instrument proficiency check as specified in GACAR § 135.349(c) may be substituted for the competency check. Additionally, there are no provisions in Part 135 which allow RFT to substitute for required checks or tests. There are no training appendices in Part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the Part 135 competency and instrument proficiency check requirements and, therefore, the RFT requirements.

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Table 4.21.6.9. Flight Training PIC/SIC Training (All Training Categories)—Multiengine Reciprocating-Powered Airplanes

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FTD				LEVEL OF FFS				A C F T
		4	5	6	7	A	B	C	D	
						VIS	PH I	PH II	PH III	
PREPARATION	Visual Inspection									X
	Pre-taxi Procedures		X	X	X	X	X	X	X	X
	Performance Limitations	X	X	X	X	X	X	X	X	X
SURFACE OPERATION	Cockpit Management			X	X	X	X	X	X	X
	Securing Cargo									X
	Starting	X	X	X	X	X	X	X	X	X
	Taxi	X				X	X	X	X	X
	[ ] Powerback Taxi						X	X	X	X
	Steep Turns SEA									X
	Sailing SEA									X
TAKEOFF	Pre-takeoff Checks		X	X	X	X	X	X	X	X
	Normal M						X	X	X	X
	Crosswind						X	X	X	X
	Short/Soft Field M							X	X	
	Glassy/Rough Water SEA								X	X
	VMC Demonstration and Recovery				X	X	X	X	X	X
	Powerplant Failure Below VMC (Rejected)		X	X	X	X	X	X	X	X
	Powerplant Failure After VMC			X	X	X	X	X	X	X
CLIMB	[ ] Lower than Standard Minimum			X	X	X	X	X	X	X
	Normal			X	X	X	X	X	X	X
EN-ROUTE	One-Engine Inoperative #			X	X	X	X	X	X	X
	Steep Turns		X	X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first stall indication		X*	X*	X	X	X	X	X	X
	Powerplant Shutdown and Restart		X	X	X	X	X	X	X	X

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	Slow Speed Handling Characteristics		X	X	X	X	X	X	X	X
	With a Powerplant Inoperative		X	X	X	X	X	X	X	X
DESCENT	Normal		X	X	X	X	X	X	X	X
	Maximum Rate		X	X	X	X	X	X	X	X
APPROACHES	VFR Procedures M Normal						X	X	X	X
	With 50 percent Loss of Power on One side PIC M				X	X	X	X	X	X
	With Slat/Flap Malfunction PIC M				X	X	X	X	X	X
	IFR Precision Approaches M ILS/Normal						X	X	X	X
	ILS/One-Engine Inoperative						X	X	X	X
	[ ] PAR/Normal						X	X	X	X
	[ ] PAR/One-Engine Inoperative #						X	X	X	X
	IFR Non-precision Approaches M NDB/Normal	A*	A*	X	X	X	X	X	X	X
	VOR/Normal A* At least one Non-precision approach must be accomplished in a level A or higher FFS or the aircraft	A*	A*	X	X	X	X	X	X	X
	Non-precision Approach One-Engine Inoperative #			X	X	X	X	X	X	X
	[ ] LOC Backcourse Procedures	A	X	X	X	X	X	X	X	X
	[ ] ASR Procedures	A	X	X	X	X	X	X	X	X
	[ ] RNAV Procedures	A	X	X	X	X	X	X	X	X

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	[ ] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)						X	X	X
	Missing Approaches M From Precision Approach				X	X	X	X	X
	From Non-precision Approach			X	X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure.								
	With Powerplant Failure			X	X	X	X	X	X
<b>LANDINGS</b>	Normal						X	X	X
	With Pitch Miss-trim PIC			X	X	X	X	X	X
	From Precision Instrument Approach			X	X	X	X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative			X	X	X	X	X	X
	With 50 percent Loss of Power on One Side PIC			X	X	X	X	X	X
	Crosswind					X	X	X	X
	Short/Soft Field					X	X	X	X
	Glassy/Rough Water SEA					X	X	X	X
	With Manual Reversion/Degraded Control Augmentation			X	X	X	X	X	X
							X	X	X
<b>AFTER LANDING</b>	Docking, Mooring and Ramping SEA							X	X
	Parking #					X	X	X	X
	Emergency Evacuation #	X	X	X	X	X	X	X	X
<b>OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE</b>	Holding	X	X	X	X	X	X	X	X
	Ice Accumulation on Airframe #		X	X	X	X	X	X	X
	Air Hazard Avoidance #			A	A	X	X	X	X

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	Windshear/Microburst #								
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>	Pneumatic/Pressurization	A	A	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X
	Hydraulic	A		X	X	X	X	X	X
	Flight Controls	A		X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X
	Autopilot		A	X	X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X	X	X	X	X	X
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>	Airborne Weather Radar	A	A	X	X	X	X	X	X
	Flight Instrument System Malfunction		A	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X
	Aircraft Fires	A	A	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X
	Powerplant Failure/Fire	A	A	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X
<b>-Emergency</b>	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X
	Air Hazard Avoidance #				X	X	X	X	X
	Windshear/Microburst M				X	X	X	X	X

**4.21.6.49. PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES)—SINGLE-ENGINE AIRPLANES.**

**A. Required Maneuvers and Procedures.** Training in the maneuvers and procedures in Table

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4.21.6.10 must be conducted for satisfactory completion of each category of flight training. Those training events annotated with an “SEA” symbol are only required for operators engaged in seaplane operations.

- 1) PICs must complete training in each training event in this table.
- 2) SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize duties of the PNF:
  - Approach and landing with pitch miss-trim
  - Steep turns

**B. Training Emphasis Considerations.** A POI should ensure that the operator’s flight training emphasizes the appropriate areas for these categories of training:

- For initial new-hire training, emphasis should be on specific company procedures
- For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type
- For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the crew member position
- For recurrent training, emphasis should be on new or required maneuvers or procedures pertinent to line operations

**C. Part 135 RFT.** RFT must be conducted periodically for both PICs and SICs, at least once every 12 months. GACAR § 135.409(c) specifies that RFT for pilots must include at least “...flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by GACAR § 135.349 (the competency check)... may be substituted for recurrent flight training.” The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate to the category, class, and type of aircraft involved. The instrument proficiency check, as specified in GACAR § 135.349(c), may be substituted for the competency check. Additionally, there are no provisions in Part 135, which

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allow RFT to substitute for required checks or tests. There are no training appendices in Part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the Part 135 competency and instrument proficiency check requirements and therefore, the RFT requirements.

**Table 4.21.6.10. Flight Training PIC/SIC Flight Training (All Training Categories)—Single-Engine Airplanes**

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FTD				LEVEL OF FFS				ACFT
		4	5	6	7	A	B	C	D	
		VIS	PH I	PH II	PH III					
PREPARATION	Visual Inspection									X
	Pre-taxi Procedures	X	X	X		X	X	X	X	X
	Performance Limitations	X	X	X	X	X	X	X	X	X
SURFACE OPERATION	Cockpit Management			X	X	X	X	X	X	X
	Securing Cargo									X
	Starting	X	X	X	X	X	X	X	X	X
	Taxi					X	X	X	X	X
	[ ] Powerback Taxi						X	X	X	X
	Steep Turns SEA									X
	Sailing SEA									X
TAKEOFF	Pre-takeoff Checks	X	X	X		X	X	X	X	X
	Normal M						X	X	X	X
	Crosswind						X	X	X	X
	Rejected M		X	X	X	X	X	X	X	X
	Short/Soft Field M							X	X	
CLIMB	Glassy/Rough Water SEA							X	X	
	Normal		X	X	X	X	X	X	X	X
	One-engine Inoperative #			X	X	X	X	X	X	X
EN ROUTE	Steep Turns		X	X	X	X	X	X	X	X
	Approaches to Stalls: M (Takeoff Config.) (En Route Config.) (Landing Config.)									
	X* Only if stall warning/stall avoidance provides first stall indication		X*	X	X	X	X	X	X	X
	Powerplant Shutdown and Restart		X	X	X	X	X	X	X	X
	Slow Speed Handling Characteristics		X	X	X	X	X	X	X	X
DESCENT	Normal		X	X	X	X	X	X	X	X
	Maximum Rate		X	X	X	X	X	X	X	X
APPROACHES	VFR Procedures M Normal Approach						X	X	X	X
	Accuracy						X	X	X	X
	IFR Precision Approaches M ILS						X	X	X	X

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	[ ] PAR						X	X	X	X
	IFR Non-precision Approaches M NDB		A*	A*	X	X	X	X	X	X
	VOR/Normal A* At least one Non-precision approach must be accomplished in a level A or higher FFS or the aircraft		A*	A*	X	X	X	X	X	X
	[ ] LOC Backcourse Procedures	A	X	X	X	X	X	X	X	X
	[ ] ASR Procedures	A	X	X	X	X	X	X	X	X
	[ ] RNAV Procedures	A	X	X	X	X	X	X	X	X
	[ ] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)						X	X	X	X
	MISSED APPROACHES M From Precision Approach				X	X	X	X	X	X
	From Non-precision Approach				X	X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure.									
LANDINGS	Normal						X	X	X	X
	Spot						X	X	X	X
	With Simulated Powerplant Failure						X	X	X	X
	With Pitch Miss-trim PIC				X	X	X	X	X	X
	From Precision Instrument Approach						X	X	X	X
	Crosswind						X	X	X	X
	Short/Soft Field						X	X	X	X
	Glassy/Rough Water SEA						X	X	X	X
AFTER LANDING	Docking, Mooring and Ramping SEA							X	X	X

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	Parking #					X	X	X	X
	Emergency Evacuation #			X	X	X	X	X	X
<b>OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE</b>	Holding		X	X	X	X	X	X	X
	Ice Accumulation on Airframe #				X	X	X	X	X
	Air Hazard Avoidance #				X	X	X	X	X
	Windshear/Microburst #			X	X	X	X	X	X
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>	Pneumatic/Pressurization	A	A	X	X	X	X	X	X
	Air Conditioning	A	A	X	X	X	X	X	X
	Fuel and Oil	A	A	X	X	X	X	X	X
	Electrical	A	A	X	X	X	X	X	X
	Hydraulic	A	A	X	X	X	X	X	X
	Flight Controls	A	A	X	X	X	X	X	X
	Anti-icing and Deicing Systems			X	X	X	X	X	X
	Autopilot		A	X	X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X	X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices			X	X	X	X	X	X
	Airborne Weather Radar	A	A	X	X	X	X	X	X
	Flight Instrument System Malfunction		A	X	X	X	X	X	X
	Communications Equipment	A	A	X	X	X	X	X	X
	Navigation Systems	A	A	X	X	X	X	X	X
<b>SYSTEMS PROCEDURES TRAINING DURING ANY PHASE</b>	Aircraft Fires	A	A	X	X	X	X	X	X
	Smoke Control	A	A	X	X	X	X	X	X
	Powerplant Malfunctions	A	A	X	X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X	X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X	X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X	X	X	X	X	X

**4.21.6.51. PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES)—ROTORCRAFT OPERATING UNDER PARTS 121 AND 135.**

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**NOTE:** The operation of transport category rotorcraft must be under GACAR Part 121. All other commercial rotorcraft operations will be conducted under Part 135. The following policy is written for Part 135 training but POI's should also use this policy as an acceptable guide for GACAR Part 121 until GACA determines that more specific guidelines are needed.

**A. Required Maneuvers and Procedures.** Training in the maneuvers and procedures (Table 4.21.6.11) must be conducted for satisfactory completion of each category of flight training. Those training events annotated with an “SEA” symbol are required only for an operator engaged in water operations.

- 1) PICs must complete training in each training event in this table.
- 2) SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize the duties of the PNF:
  - Category “A” vertical and/or edge takeoffs and landings
  - Approach and landing with anti-torque malfunctions

**NOTE:** The levels of FSTDs to be used for the training events listed in Table 4.21.6.11 are currently under development.

**B. Training Emphasis Considerations.** A POI should ensure that the operator’s flight training emphasizes the appropriate areas for these categories of training:

- For initial new-hire training, emphasis should be on specific company procedures
- For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type
- For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the crew member position
- For recurrent training, emphasis should be on new or revised maneuvers or procedures pertinent to line operations

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- For all pilot training programs, emphasis should be on avoidance and recovery from inadvertent entry into instrument meteorological conditions (IMC), including the loss of adequate surface or horizontal reference in visual flight rules (VFR) conditions, and the application of the operator's controlled flight into terrain (CFIT) avoidance program
- For all training programs, emphasis on operations in various environments, such as mountainous areas, deserts, overwater, and in desolate areas

**C. Part 135 RFT.** RFT must be conducted periodically for both PICs and SICs, at least once every 12 months. GACAR § 135.409(c) specifies that RFT for pilots must include at least "...flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by GACAR § 135.349 (the competency check)...may be substituted for recurrent flight training." The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate to the category, class, and type of aircraft involved. The instrument proficiency check, as specified in GACAR § 135.349(c), may be substituted for the competency check. Additionally, there are no provisions in Part 135 listing the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the Part 135 competency and instrument proficiency check requirements and, therefore, the RFT requirements.

**D. Rotorcraft FSTD Usage.** The criteria for the use of rotorcraft FSTDs are currently under development. Several rotorcraft FSTDs have been individually approved using interim criteria. These devices and simulators may continue to be used in Part 135 training and checking activities in accordance with specific approvals currently in effect.

### 4.21.6.53. ROTORCRAFT - LOSS OF CONTROL ACCIDENT AVOIDANCE TRAINING AND CHECKING REQUIREMENTS.

**A. Loss of Control.** All rotorcraft pilots should be trained and checked on procedures for the avoidance of loss of control (LOC) accidents, specifically, recovery from inadvertent instrument meteorological conditions (IMC). It should be noted that inadvertent IMC may occur in meteorological conditions that meet or exceed authorized visual flight rules (VFR) ceiling and visibility minima. Inadvertent IMC may occur in these conditions when visual conditions do not allow for the determination of a usable horizon, such as flat light conditions, and night operations over unlit surfaces in low-lighting conditions. Even though these conditions may

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occur in high ceiling and visibility environments, the effect is the same—a loss of horizontal or surface reference by which the pilot typically controls a rotorcraft in VFR flight. Without adequate training and checking, these conditions may not be survivable.

**B. Approving Methods.** POIs should approve methods appropriate to the aircraft, equipment, and facilities available. POIs should consider the operator's hiring standards and practices (such as requiring a rotorcraft instrument rating for VFR pilots) in evaluating training and checking modules. POIs shall ensure that an operator's pilots accomplish these training and checking events in the aircraft in which the pilot will be qualified for revenue operations (or in an appropriately equipped FSTD). The events should reflect a realistic course of action the pilot might take to escape from an inadvertent encounter with IMC.

**C. Encounters with IMC.** All pilots must receive training on avoidance and recovery from inadvertent encounters with IMC, including those authorized to conduct IFR operations under OpSpecs Part R. Unplanned transition from an intended VFR flight to emergency IFR operations involves a different set of pilot actions, including different navigation and operational procedures, interaction with air traffic control (ATC), and CRM.

**D. Identifying IMC Circumstances.** Training and checking should emphasize the identification of circumstances conducive to inadvertent IMC encounters. This training and checking must emphasize pilot and operator discipline to abandon continued VFR flight in deteriorating conditions. This discipline should include an established minimum altitude/airspeed combination. If this altitude/airspeed combination cannot be maintained, the discipline will dictate a diversion to better conditions or a return to starting base. Conditions may also dictate a landing short of the destination, even an off-aerodrome precautionary landing, or initiating an emergency transition to IFR as appropriate to the situation.

**E. Training Requirements.** Training and checking for all pilots, whether rotorcraft instrument-rated or not, must include attitude instrument flying, recovery from unusual attitudes, ATC communications, and an instrument approach. If the aircraft is appropriately equipped and the check is conducted at a location where an instrument landing system (ILS) is operational, an ILS approach should be demonstrated. If ILS procedures cannot be performed, another instrument approach must be performed. Partial panel operations should be considered if attitude and gyroscopic heading information are available from single sources.

### 4.21.6.55. ROTORCRAFT - CFIT AVOIDANCE. A review of accident data indicates that

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controlled flight into terrain (CFIT) accidents, especially in night and low visibility conditions, are a significant operational risk. This paragraph describes the implementation of CFIT avoidance programs by rotorcraft operators.

### A. Operator and GACA Actions.

- 1) Each operator must develop and use a CFIT avoidance program. The POI must review the operator's program in total to determine its effectiveness in avoiding CFIT accidents.
- 2) CFIT avoidance techniques are classified as supporting either tactical or strategic avoidance of terrain or obstacles.
- 3) Examples of strategic CFIT accident avoidance systems could include:
  - a) The Use of IFR Procedures. IFR operations provide path definition (lateral navigation) coupled with obstruction clearance criteria that protect the aircraft from CFIT accidents when operating at or above minimum published altitudes, and in accordance with standard IFR operating procedures.
  - b) The Use of RNAV-Based Navigation Routes with Preflight Obstacle Assessment Conducted to Determine the Minimum Safe Altitude Along the Route. These routes may be pre-planned or may be made up as required route using a variety of computer-based tools. CFIT avoidance is supported by assessing obstacles along the route, and to each side by an appropriate amount (e.g., four km), and adding a safety buffer (e.g., 300 ft.) above the highest point along the route. Just as in IFR operations, a specific portion of the route may be assessed separately, allowing lower altitudes to be used along certain portions of the route when obstacles do not require the higher altitude.
- 4) Examples of tactical CFIT avoidance systems include:
  - a) The Integration of Night Vision Imaging Systems (NVIS) into VFR Operations. The use of NVIS in VFR conditions (meeting OpSpecs-authorized minimum ceiling and visibility requirements) can increase the ability of pilots to successfully identify and avoid terrain and obstructions in low lighting conditions at night.
  - b) The Use of a Radio Altimeter (RA) or Terrain Awareness and Warning Systems (TAWS) in VFR Operations. These devices can enhance situational awareness (SA)

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during VFR flight operations, and can support CFIT avoidance.

5) The more effective CFIT avoidance programs integrate strategic and tactical CFIT avoidance technologies and procedures. To be acceptable, an integrated CFIT avoidance program must:

- a) Strategically identify flightpaths and altitudes that would result in inadequate obstacle/terrain clearance and adjust appropriately.
- b) Provide information and procedures that support the selection of flightpaths and altitudes that safely avoid CFIT encounters.
- c) Provide information and procedures that support safe and effective decision making, both in preflight planning as well as inflight operations (to include initiation, cancellation, diversion, or termination of flight operations).
- d) Capitalize on tactical CFIT avoidance capabilities.

**B. CFIT Avoidance Program Integration.** CFIT avoidance programs can exist in a variety of configurations. The following components, or any portion, may be mixed and matched in virtually any combination of other components, depending on operator preference. The success of the desired configuration depends on the integration of available operational information, airborne and ground technology, and operating procedures. The following are examples of components of a CFIT avoidance program:

1) Operational Information.

- a) Obstacle and terrain data must be in a form that is usable by crew members in flight planning and execution. Data should be available in common form for pilots and ground communications personnel. Current VFR charts are the minimum standard for this data.
- b) This data may be supplemented by electronic database(s). When electronic database(s) are used, data commonality between ground and flight personnel may not be possible; however, all participants must understand the content, application, and limitations of the electronic database(s).

2) Airborne Technology.

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- a) Radar altimeter and TAWS systems. These systems can provide terrain awareness while airborne and when coupled with obstacle/terrain evaluation procedures can be valuable in avoiding CFIT accidents.
- b) GPS. The use of GPS is prevalent in the rotorcraft community and may be applied with tremendous benefit to CFIT avoidance. GPS provides a highly accurate and repeatable navigation capability and, when coupled with obstacle/terrain data through an obstacle evaluation procedure, may result in a high confidence in avoiding CFIT accidents.

### C. Uses of GNSS in CFIT Avoidance.

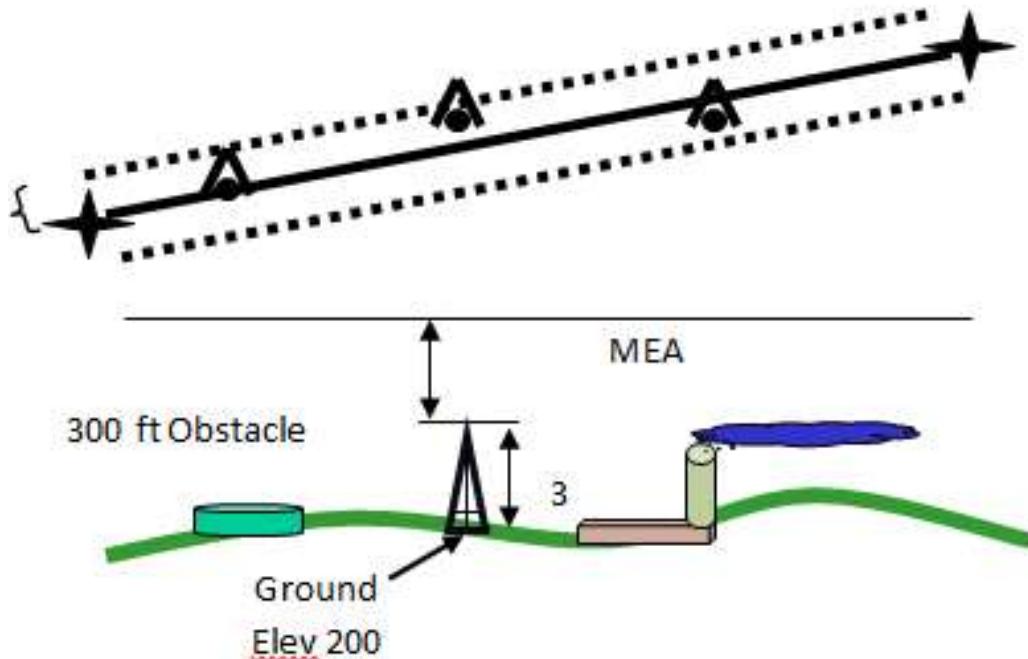
- 1) *Terrain/Obstacle Avoidance through Preflight Obstacle Assessment and Navigation Procedures.* This method integrates navigation performance and obstacle terrain data to specify a route and minimum altitude for CFIT avoidance. The steps in this process include:
  - a) Define routes using latitude/longitude or aerodrome/navigational aid references.
  - b) Plot route on the appropriate sectional chart.
  - c) Measure two NM's each side.
  - d) Identify the highest obstacle (the controlling obstacle) and its elevation (mean sea level (MSL)).
  - e) Add an appropriate obstacle clearance value (minimum 300 feet) to determine the minimum altitude along this route. This is similar to the application of required obstacle clearance in the design of instrument procedures.
  - f) Load and activate a user-defined flight plan using the preflight planning coordinates.
  - g) While airborne, operate the GNSS in the rotorcraft in the “Terminal” mode, which invokes a one NM course deviation indicator (CDI) sensitivity, and a receiver autonomous integrity monitoring (RAIM) limit of no more than one NM. See Figure 4.21.6.2 for a graphical description of this method of CFIT avoidance.

**Figure 4.21.6.2. Use of GNSS in CFIT Avoidance**

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*2) Use of GNSS (e.g. GPS) for SA.*

- a) Operators may use the user-defined waypoint function of their GPS receivers to mark known obstructions and terrain features for enhanced situational awareness. For example, if an operator's area includes a terrain peak or an antennae farm, then that set of obstructions can be entered into the user-defined database using a waypoint identifier such as HIGND, TTVTR, etc., to imply hazard. If multiple entries for similar features in the area are made, numerically sequence the names using some geographical logic (e.g., north to south, near base to far from base) that is agreed to and understood by all users. Examples include TVTR1, TVTR2, HIGD1, HIGD2, etc.
- b) The latitude and longitude may be entered from data found on a sectional chart or by noting the position while overflying the obstacle feature. Many receivers have a "mark position" function that allows users to automatically capture position data and then later name the navigation fix as desired.

**NOTE:** When this system is used, procedures should be in place to ensure personnel do not make changes to the user-defined waypoint database that would affect the set of operator-

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established situational awareness waypoints.

- c) These user-defined obstruction and terrain waypoints can be used inflight in several ways, depending on equipment capabilities and operator procedures:

3) *RA*.

- a) Radio altitude (RA) can provide critical information of the current height above terrain. This information is valuable when combined with position information, terrain elevation, and obstacle information, and can enhance situational awareness.
- b) The limitations of RA, however, must be understood. An RA provides only current terrain clearance information. It has no “look-ahead” capability and cannot identify height above obstacles unless it provides a return to the RA transceiver. In fact, the IFR use of RA is limited to determining decision altitude/height-only over surveyed and relatively level terrain.
- c) RA systems provide their greatest benefit when integrated with other navigation systems and procedures.

4) *TAWS*. TAWS provides visual and aural warning of approaching terrain or obstacles that would constitute a hazard to continued flight along the present flightpath. While all TAWS systems improve situational awareness, many TAWS systems designed for airplanes employ alerting and warning logic not optimized for rotorcraft operations, leading to unnecessary alerts and warnings. However, these systems can provide a great increase in the level of pilot awareness of prominent terrain and obstruction features and can greatly enhance safety. Some systems are configured specifically for rotorcraft operations, and offer additional capability for CFIT avoidance. In all cases, TAWS is best used when integrated into a system of CFIT avoidance which includes planning, navigation, and flight procedures.

5) *NVIS*.

- a) The use of NVIS can substantially reduce the risk of CFIT accidents in low lighting conditions. Their use requires issuance of OpSpec R123 and compliance with the appropriate airworthiness, training, and operations requirements.
- b) The use of NVIS as the sole source for CFIT avoidance is a tactical method. However,

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NVIS can greatly support strategic avoidance of CFIT accidents when integrated into a complete CFIT avoidance program.

**D. Operating Procedures.** CFIT avoidance begins with the preflight planning for a flight assignment.

- 1) This planning must include:
  - a) Identifying the route of flight.
  - b) Identifying the terrain and obstacles along the path within the area of expected navigation performance.
  - c) Identifying the altitude required to cross the terrain and obstacles by a safe amount.
  - d) Considerations for deviation and diversion in the case of deteriorating weather or seeing conditions (where the “soft” direction is; that is, where the terrain and obstacles are lower).
- 2) The development of this plan should be made in coordination with other crew members.
- 3) Once the plan is determined, the plan must be briefed by the pilot to other crew members so that all have the same understanding of the profile (route and altitude) of the expected flight.
- 4) Upon initiation of the flight, the pilot must observe the minimum altitudes to ensure CFIT avoidance. He should still maintain a sharp lookout for obstacles and terrain along the route of flight and maneuver as appropriate. All tactical systems must be employed to avoid a CFIT accident (NIVIS, RA, TAWS, certain GNSS applications, and the use of all available crew members in scanning for terrain and obstacles).
- 5) If a deviation from the planned flight profile is required, the pilot should consult with the other crew members, if available and trained, to develop an appropriate course of action. This course of action must include an evaluation of terrain and obstacles along the newly identified path and the determination of a new minimum altitude.
- 6) If unable to maintain this altitude due to weather or other consideration, diversion to an

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alternate destination or a precautionary landing must be considered. If the decision is made to continue, identify all controlling obstacles and terrain (those that penetrate above the minimum clearance height) ahead of the aircraft as early as possible, as the flight progresses. Use all available technologies and personnel aboard the aircraft to facilitate early detection and avoidance of terrain and obstacles.

**Table 4.21.6.11. Flight Training PIC/SIC Flight Training (All Training Categories)—Rotorcraft**

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FTD				LEVEL OF FFS				A C F T
		4	5	6	7	A	B	C	D	
		VIS	PH I	PH II	PH III					
PREPARATION	Visual Inspection									
	Before Taxi Procedures									
	Performance Limitations									
SURFACE OPERATION	Starting									
	Rotor Engagement									
	Rotor Engagement on Water SEA									
	Taxiing									
	Water Taxiing SEA									
	Lift-to-Hover IGE/OGE M									
	Hover Turns IGE/OGE									
	Sideward/Rearward Hovering									
	Slope Operations									
	Liftoff									
	Landing									
	Taxiing									
TAKEOFF	Normal M									
	Instrument									
	Obstacle Clearance									
	Running (High Altitude)									
	Category "A" M									
	Category "A" M With Powerplant Failure Before CDP									
	Category "A" M With Powerplant Failure After CDP CLIMB									
	Rejected Takeoff M									
CLIMB	Normal									
	Best Rate									
	Best Angle									
EN-ROUTE	Medium-Banked Turns									
	Powerplant Shutdown and Restart									
	Low Speed Characteristics									

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	High Speed Handling Characteristics							
	High Speed Handling Characteristics							
<b>DESCENT</b>	Normal							
	Maximum Rate							
	Autorotative Glide							
<b>APPROACHES</b>	VFR Procedures M							
	Normal							
	Obstacle Clearance							
	High Altitude							
	Elevated Landing Site							
	With Degraded Control Augmentation							
	Balked Landing M							
	IFR Precision Approaches M							
	ILS/Normal							
	ILS/One-Engine Inoperative							
	[ ] PAR/Normal							
	[ ] PAR/One-Engine Inoperative #							
	IFR Non-precision Approaches M							
	NDB/Normal							
	VOR/Normal							
	[ ] LOC Backcourse Procedures							
	[ ] ASR Procedures							
	[ ] RNAV Procedures							
	[ ] Circling Approach M (Simulator must be qualified for training/checking on the circling maneuver)							

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	Missing Approaches M From Precision Approach From Non-precision Approach NOTE: At least one MAP must be a complete approved procedure. With Powerplant Failure								
<b>LANDINGS</b>	Normal								
	Normal-to-the-water SEA								
	[ ] Category "A"								
	[ ] Category "A" With Powerplant Failure after LDP								
	Crosswind								
	From Precision Instrument Approach								
	From a Precision Approach With at Least 50 percent Power Deficiency								
	With Degraded Control Arguments								
	Taxi								
	Parking #								
<b>AFTER LANDING</b>	Stopping the Rotors								
	Emergency Evacuation #								
<b>UNPREPARED SITE OPERATIONS</b>	Confined Areas								
	Pinnacles								
<b>OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE</b>	Ridgelines								
	Water Sites SEA								
	Holding								
	Ice Accumulation on Airframe #								
	Air Hazard Avoidance #								
	Windshear/Microburst #								

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<b>SYSTEMS</b>	Pneumatic/Pressurization							
<b>PROCEDURES</b>	Air Conditioning							
<b>TRAINING</b>	Fuel and Oil							
<b>DURING ANY PHASE</b>	Electric							
	Hydraulic							
-Normal	Flight Controls							
-Abnormal	Anti-icing and Deicing Systems							
-Alternate	Autopilot							
	Flight Management Guidance Systems							
	Automatic or Other Approach & Landing Aids							
	Loss of Anti-Torque Effectiveness M							
	Airborne Weather Radar							
	Flight Instrument System Malfunction							
	Communications Equipment							
	Navigation Systems							
<b>SYSTEMS</b>	Aircraft Fires							
<b>PROCEDURES</b>	Smoke Control							
<b>TRAINING</b>	Powerplant Malfunctions							
<b>DURING ANY AIRBORNE PHASE</b>	Electrical, Hydraulic, Pneumatic Systems							
	Flight Control Systems Malfunction							
-Emergency	Landing Gear Malfunction							
	Anti-Torque Failure M							

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	Settling-with-Power								
<b>NIGHT VISION IMAGING SYSTEMS (NVIS) ADDITIONAL CONSIDERATION</b>	NVIS Operational Checks								
	NVIS Failure								
	Inadvertent IMC								
	Unusual Attitude Recovery								
	Transitions: Aided/Unaided								
	Ground Hazard Recognition								
	Brownout/Whiteout/Flat Light Operations								
	External Light Techniques								
	Scanning Techniques								

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#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 7. Flight Crew Qualification Curriculum Segments**

**4.21.7.1. GENERAL.** This section contains direction and guidance concerning qualification curriculum segments and qualification modules. A qualification curriculum segment is the final segment of each of the six categories of training defined in Section 1 of this chapter. A qualification curriculum segment is composed of the testing, checking, and experience modules that a flight crew member must successfully complete after formal training and before being qualified to serve unsupervised as a required flight crew member in General Authority of Civil Aviation Regulation (GACAR) Part 121 or 135 operations.

**A. Primary Objectives.** A qualification curriculum segment has the following primary objectives:

- To ensure that each flight crew member has reached an acceptable level of proficiency in all assigned duties before being released from training and supervision
- To provide a means for measuring the effectiveness of the training program, and for identifying and correcting training deficiencies

**B. Guidance Application.** The guidance in this section applies to the development and approval of qualification curriculum segments for both GACAR Part 121 and 135 training curriculum. In general, equivalent qualification modules are required by both of these regulatory parts. Differences do exist, however, between GACAR Part 121 and 135 curriculum segments in both terminology and details. When the guidance in this section applies specifically to one flight crew duty position or regulatory part, the duty position or regulatory part will be specified.

**4.21.7.3. TYPES OF QUALIFICATION MODULES.** Qualification curriculum segments are composed of qualification modules. Qualification modules are generally divided into testing, checking, and experience modules.

**A. Definitions.** The following definitions are used in this section:

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- 1) *Qualification Curriculum Segment.* The segment of a specified curriculum that begins when formal training has been completed, and ends when the airman is fully qualified to perform unsupervised and without restriction in revenue service.
- 2) *Testing.* Any form of examination of knowledge or skill, whether oral, written, or practical.
- 3) *Checking.* Specifically, a practical skills test. (For flight crew members, a check consists of physical manipulation of aircraft controls in real time.)
- 4) *Basic Checking Module.* The proficiency or competency check listed in a qualification segment of a curriculum outline required for qualification in the basic duties of an airman position.
- 5) *Additional Checking Module.* A check conducted to qualify an airman for an additional level of responsibility or skill, beyond that of the basic crew position.
- 6) *Experience Module.* An operation conducted in revenue service that is either under supervision or under restriction, and is measured in flight hours or in the number of repetitions of an event.
- 7) *Line-Oriented Flight Training (LOFT).* LOFT is a module of training conducted in a FFS after completion of a basic checking module to satisfy the requirements of Part 121, Appendix D.

**B. Experience Modules.** The GACARs require that experience modules be completed before a crew member perform unsupervised and without restriction in revenue service. Other experience modules are required for special authorizations or to reestablish currency. One or more of the following experience modules may be required in a qualification curriculum segment:

- Operating Experience (OE)
- Pilot-in-command (PIC) experience (required to use standard turbojet minimums)
- Special operations experience (such as Performance Based Navigation (PBN))
- Currency (to reestablish landing or instrument currency)

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**4.21.7.5 FORMAT OF QUALIFICATION CURRICULUM SEGMENTS.** The content of a qualification curriculum segment for GACAR Part 121 operations is almost entirely controlled by regulation. A GACAR Part 121 operator may, however, use more than one means of accomplishing these requirements. For example, an operator could conduct checks for most categories of training in a level C full flight simulator (FFS). In such a case, the operator would be required to conduct a LOFT training module after the completion of the basic checking module. An operator that uses a level A FFS would be required to conduct the basic checking module in the simulator and a second module in the airplane. The requirements of a GACAR Part 135 competency check are not specified in GACAR, but are left to the discretion of the principal operations inspector (POI) and the check pilot conducting the check. To ensure that a clear understanding exists between the operator and the General Authority of Civil Aviation (GACA), the POI should require that the operator list each element or event in a qualification module along with the device to be used. The operator's format may either be a simple outline, a table such as those contained in Table 4.21.7.2, Part 135 Checking Modules - Airplanes and Table 4.21.7.3, Part 135 Checking Modules - Rotorcraft or any other format that the POI finds clearly establishes the methods to be used and elements and events to be checked.

**4.21.7.7. PART 121 REQUIRED CERTIFICATES.** All flight crew members must hold specific certificates and ratings before performing duties under GACAR Part 121. If a flight crew member does not hold the required certificates and/or ratings, they must be obtained when the flight crew member completes the qualification curriculum segment.

**A. PIC, AIRPLANE or ROTORCRAFT.** A PIC in GACAR Part 121 operations must hold the following:

- Airline Transport Pilot (ATP) Certificate
- Airplane or Rotorcraft category rating
- Appropriate class rating
- Applicable type rating
- Class 1 medical certificate

**B. Second in Command (SIC).** A SIC in GACAR Part 121 operations must hold the following:

- Commercial pilot certificate or ATP

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- Instrument rating or ATP
- Airplane or Rotorcraft category rating
- Appropriate class rating
- Applicable type rating
- Class 1 medical certificate

**C. Flight Engineer (FE).** A FE must hold the following:

- FE certificate
- Applicable class rating
- At least a Class 2 medical certificate

**4.21.7.9. PART 135 REQUIRED CERTIFICATES AND RATINGS.** All pilots must hold specific certificates and ratings before performing duties in GACAR Part 135 revenue service.

**A. Pilot Certification Requirements - Airplanes.** Pilot certification requirements for GACAR Part 135 airplane operations depend on the kind of operation being conducted and the type of aircraft used.

1) PICs conducting flight operations in airplanes operated under Part 135 must hold the following:

- ATP certificate
- Commercial pilot certificate with instrument—airplane rating
- Airplane category rating
- Class 1 medical certificate
- Class rating (as applicable):

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- o Airplane Single Engine Land
  - o Airplane Multi Engine Land
  - o Airplane Single Engine Sea
  - o Airplane Multi Engine Sea
- 2) SICs conducting any operations must hold the same requirements as a PIC.

**NOTE:** Certain pilots conducting visual flight rules (VFR) only operations under GACAR Part 135 with single engine reciprocating-powered airplanes in isolated areas, may be relieved of the requirement to hold an instrument rating in accordance with GACAR § 135.341(d) and authorized by operations specification (OpSpec) A20.

**B. Pilot Certification Requirements—Rotorcraft** The pilot certification requirements for pilots conducting Part 135 rotorcraft operations are as follows:

- 1) All PICs and SICs must hold at least the following:
  - Commercial pilot certificate or ATP
  - Rotorcraft category rating
  - Rotorcraft class rating
  - Class 1 medical certificate
- 2) All PICs must hold a type rating, if a type rating is required.
- 3) PICs conducting instrument flight rules (IFR) or VFR over-the-top operations in rotorcraft must hold a rotorcraft instrument rating or an ATP that is not limited to VFR.

**4.21.7.11. PART 135 MINIMUM PIC FLIGHT EXPERIENCE REQUIREMENTS.** GACAR § 135.341(b) and (c) require that a PIC who does not hold an ATP and who conducts operations that do not require an ATP, must have acquired a minimum number of flight hours before serving as a PIC.

**A. VFR Requirements.** Before serving as a PIC in a VFR operation, the pilot must have

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accumulated at least the following flight hour experience:

- 500 total pilot flight hours
- 100 cross-country flight hours
- 25 night, cross-country flight hours

**B. IFR Requirements.** Before serving as a PIC in an IFR operation, the pilot must have accumulated at least the following flight hour experience:

- 1,200 total pilot flight hours
- 500 cross-country flight hours
- 100 night flight hours
- 75 actual or simulated instrument flight hours, 50 of which must have been in actual flight

**NOTE:** Refer to Volume 9, Chapter 3, Airline Transport Pilot (ATP) Certification under Part 61, for guidance concerning the crediting of flight time in airplanes and rotorcraft to meet these requirements.

**4.21.7.13. THE BASIC CHECKING MODULE.** The basic checking modules for GACAR Part 121 and 135 are composed of two parts. One part consists of the written or oral test elements and the other part consists of the flight check events. Although they are distinct and separate parts, when combined they make up a single checking module.

**A. Basic Checking Module Content.** The subject areas that must be addressed in the written or oral test for the Part 121 basic checking module are described in Part 121, Appendix C. The subject areas that must be addressed in the written or oral test for the Part 135 basic checking module are described in GACAR § 135.349(a) and, for those PICs conducting IFR operations, in, GACAR § 135.351(c). These regulations require a written or oral test element as a distinct part of the basic checking module. The basic checking modules required for Part 121 and 135 are further discussed in paragraphs 4.21.7.15 and 4.21.7.17.

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**B. Performance Standards.** In GACAR Part 121 and 135 operations, a higher standard of proficiency may be required than that required for initial pilot certification. The standard required for basic checks is at least that required for obtaining the certificate which must be held to act as PIC. For example, an SIC holding a commercial certificate with an instrument rating who is making an instrument landing system (ILS) approach in a B-747 must perform to the same standard of proficiency as the PIC seated in the left seat who holds an ATP and a B-7470 type rating. POIs should bring the following guidance pertaining to proficiency and competency checks in Volume 9, Airman - Certification, to the operator and check pilot's attention:

1) *Use of FFSs.* An operator may take maximum advantage of flight crew training devices in designing qualification curriculum segments. For example, an operator may evaluate a PIC and an SIC simultaneously on many normal, non-normal, and emergency procedures when a full flight simulator (FFS) is used. POIs should encourage operators to design qualification modules accordingly.

2) *LOFT Training.* A LOFT training module is considered to be part of the qualification curriculum segment, but is an experience event, not a checking event. A pilot who qualifies for a certificate or rating in a level C or D FFS is issued the certificate or rating immediately after satisfactorily completing the basic check. The pilot is not qualified to either exercise the privileges of the certificate or rating, or enter revenue service until the pilot has successfully completed the LOFT training module.

**4.21.7.15. PART 121 BASIC CHECKING MODULE.** The basic checking module required in GACAR Part 121 is referred to as a proficiency check. For pilots, a proficiency check consists of the written or oral test elements and the flight-test events specified in GACAR Part 121, Appendix C. Figure 4.21.7.1, Pilot Proficiency Check (Part 121), summarizes the elements and events that make up a proficiency check. A proficiency check qualifies pilots for both VFR and IFR navigation and instrument approaches to standard minimums (Category I Approach (CAT I), if approved for the operator). Operations such as Category II Approach (CAT II) or Category III Approach (CAT III) require additional checking modules. For an flight engineer (FE), the proficiency check consists of the flight test events summarized in Figure 4.21.7.2, Flight Engineer Proficiency Check (Part 121). Although GACAR Part 121 does not specifically require a written or oral test element as part of the FE proficiency check, it is a GACA policy that a written or oral test be part of the FE proficiency check. POIs must ensure the test is included as an element of the basic checking module.

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**Figure 4.21.7.1. Pilot Proficiency Check (Part 121)**

<b>ORAL OR WRITTEN EQUIPMENT EXAM</b>	Both
<b>GROUND OPERATIONS</b>	
• Preflight inspection .....	Both
• Taxiing/Runway Operations .....	Both
• Powerplant checks.....	Both
<b>TAKEOFFS</b>	
• Normal.....	Both
• Instrument .....	Both
• Crosswind .....	Both
• With powerplant failure .....	Both
• Rejected takeoff.....	Both <sup>*1</sup>
<b>INSTRUMENT PROCEDURES</b>	
• Area departure.....	Both*
• Area arrival.....	Both*
• Holding .....	Both*
• Normal ILS approach.....	Both
• Engine-out ILS.....	Both
• Coupled ILS approach.....	Both <sup>1</sup>
• Non-precision approach .....	Both
• Second non-precision approach .....	Both
• Missed approach from an ILS.....	Both
• Second missed approach .....	PIC
• Circling approach.....	Both <sup>*2</sup>
<b>IN-FLIGHT MANEUVERS</b>	
• Steep turns.....	PIC*
• Specific flight characteristics .....	Both
• Approaches to stalls .....	Both*
• Powerplant failure .....	Both
• Two-engine inoperative approach..... (three- and four-engine aircraft)	Both
• Normal landing .....	Both
• Landing from an ILS .....	Both
• Crosswind landing.....	Both
• Landing with engine-out .....	Both

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- Landing from circling approach.....Both<sup>\*2</sup>

**NORMAL AND NONNORMAL PROCEDURES Both<sup>3</sup>**

- Rejected landing.....Both
- Two-engine inoperative approach.....PIC  
(three- and four-engine aircraft)

**OTHER EVENTS.....At Check Pilot's Discretion<sup>\*4</sup>****NOTES:**

"Both:" The term "both" applies to PICs and SICs.

\* = May be waived under certain conditions. (Refer to Volume 9, Chapter 3, Section 2, General Guidance for Flight Test Events.

<sup>1</sup> = PIC and SIC may both simultaneously take credit for this event.

<sup>2</sup> = When the operator is authorized to conduct circling approaches according to OpSpecs C75 (this is not required for SICs if the operator's manual prohibits SICs from making this approach).

<sup>3</sup> = See guidance contained in Volume 9, Chapter 3, Section 2, General Guidance for Flight Test Events.

<sup>4</sup> = The check pilot is authorized to evaluate any event required for the ATP (Refer to Volume 9, Chapter 1, Section 2, Inspector Qualifications for Airmen Examinations).

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### Figure 4.21.7.2. Flight Engineer Proficiency Check (Part 121)

#### NORMAL PROCEDURES

- Oral or written examination
- Exterior preflight
- Interior preflight
- Panel setup
- Fuel load
- Engine start procedures
- Taxi and before takeoff procedures
- Takeoff and climb
- Pressurization
- Cruise and fuel management
- Descent and approach
- After landing and securing
- Crew coordination
- Situational awareness, traffic scan, etc.
- Performance computations
- Anti-ice, deice

#### NON-NORMAL AND EMERGENCY PROCEDURES

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Sample as many non-normal and emergency procedures as needed to evaluate performance:

- Troubleshooting
- Knowledge of checklist
- Ability to perform procedures
- Crew coordination
- Minimum equipment list (MEL) and Configuration Deviation List (CDL)

**4.21.7.17. PART 135 BASIC CHECKING MODULE.** The flight test required to qualify a pilot for revenue service is termed a basic checking module when listed in a curriculum outline. Operators must design the basic checking module of a Part 135 curriculum to satisfy the requirements of GACAR § 135.349. In addition, operators must satisfy the requirements of GACAR § 135.351 for PICs conducting IFR operations. Those operators whose PICs are authorized to use an autopilot (AP) in lieu of an SIC in IFR operations must include a demonstration of these skills in the basic checking module. This paragraph contains guidance POIs will use to review and approve basic checking modules and to conduct these checks.

**A. GACAR § 135.349 Requirements.** All pilots who are qualifying in an aircraft type are required by GACAR § 135.349 to complete a competency check in that type of aircraft before entering revenue service and annually thereafter. GACAR § 135.349(b) allows the President to define airplanes with similar characteristics as a single type for purposes of this rule (refer to Section 1, paragraph 4.21.1.5, Aircraft Families, for aircraft of the equivalent series which are defined as a single type). The requirements of GACAR § 135.349 are aircraft specific; that is, each pilot must satisfactorily complete a competency check in each type of aircraft (as defined in paragraph 4.21.1.5) prior to operating that aircraft in revenue service. GACAR § 135.349 does not specify the maneuvers (events) that must be accomplished on a competency check. The rule authorizes the President or check pilot to make this determination. To ensure standardization and an adequate level of safety, the minimum acceptable content of competency checks for Part 135 curriculums is established by this paragraph and is listed in Tables 4.21.7.1 and 4.21.7.2. Because operators may be authorized to conduct VFR-only operations or a combination of VFR and IFR operations, separate requirements have been established for VFR-only competency checks and for combined VFR and IFR operations competency checks. These requirements are indicated in columns marked “VFR COMP” and “IFR COMP” on each figure. As a matter of

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policy, some demonstration of competency of the pilot's ability to maneuver the aircraft solely by reference to instruments must be included on each competency check. For VFR competency checks, this demonstration will be appropriate to the aircraft's installed equipment and the operating environment. (Refer to note 7 to Table 4.21.7.1 and note 4 to Table 4.21.7.2.) The requirements for a "night vision imaging system (NVIS)" competency check are not rotorcraft make and model specific, because the appliance used is not unique to that rotorcraft and may be used in several different types of appropriately NVIS-modified rotorcraft. Therefore, a crew member who has been previously NVIS qualified in another rotorcraft is not required to demonstrate annual NVIS/NVG competency in each make and model of rotorcraft, once the initial approval and checkout is completed under the appropriate provisions of Part 91, Appendix D in the applicable make/model rotorcraft. However, it is recommended that the POI alternate NVIS competency checks between rotorcraft to ensure an adequate level of competency in each rotorcraft. If the NVIS Part 91, Appendix D checkout is used to satisfy the requirements of the "VFR COMP" GACAR § 135.349 check, the check must be completed in the specific make and model of rotorcraft for which the operator seeks GACAR § 135.349 qualification.

**B. GACAR § 135.351 Requirements.** GACAR §135.351 requires that PICs complete an instrument proficiency check prior to conducting IFR revenue operations. Thereafter, the PIC must have completed an instrument proficiency check within the preceding 6 months to continue IFR revenue operations. The requirements of GACAR § 135.351 are not aircraft specific; that is, a single check fulfilling the requirements of GACAR § 135.351 is sufficient to qualify a PIC to conduct IFR operations in all types of aircraft in which the PIC is qualified according to GACAR § 135.349. GACAR § 135.349(c) specifies that the check conducted to satisfy GACAR § 135.351 simultaneously satisfies the requirements of GACAR § 135.349 for the type of aircraft in which the check is accomplished.

**NOTE:** The oral or written test requirements of GACAR § 135.349(a) must be completed.

- 1) *Operations Requiring ATP.* GACAR § 135.351(c)(1) requires that for operations requiring an ATP, the instrument proficiency check must consist of the maneuvers required for original issuance of that certificate and any applicable type rating.
  
  - 2) *Operations Requiring Commercial Certificates.* GACAR § 135.351(c)(1) also requires that for operations requiring a commercial certificate and an instrument rating, the instrument proficiency check must consist of the maneuvers required for the original issuance of a commercial certificate, an instrument rating, and any applicable type rating.
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**C. Basic Checking Modules for GACAR § 135.349 VFR Competency Check.** The minimum events for a GACAR § 135.349 VFR competency check are listed in the columns marked “VFR COMP” in Table 4.21.7.1 for airplanes and in Table 4.21.7.2 for rotorcraft.

**D. Basic Checking Modules for GACAR § 135.349 IFR Competency Check.** The minimum events for a GACAR § 135.349 IFR competency check are listed in the column marked “IFR COMP” in Table 4.21.7.1 for airplanes and in Table 4.21.7.2 for rotorcraft.

1) *PIC Requirements.* PICs being trained in initial equipment and transition curriculum for IFR operations have normally completed the requirements of GACAR § 135.351 within the preceding 6 months. If this is the case, the qualification module for these categories of training need only satisfy the requirements of GACAR § 135.349. The columns marked “IFR COMP” in Tables 4.21.7.1 and 4.21.7.2 reflect this assumption. When this assumption is not true, the operator must ensure that PICs meet the requirements of GACAR § 135.351.

2) *Multiengine, General Purpose Family.* Section 1 of this chapter, lists airplanes of the multiengine, general-purpose family that the President has determined to be of the same type for purposes of training and checking. Table 4.21.7.1 is constructed on the assumption that pilots in the transition category are qualifying in airplanes that are not of the same series. The basic qualification module of a transition training course for airplanes of the same series of the multiengine general purpose family of airplanes consists of the oral or written test required by GACAR § 135.349(a)(2).

3) *Single-Engine, General Purpose Family.* All single-engine, general purpose airplanes are considered to be a single type for the purpose of training and checking. The qualification module of the transition category of training is the written or oral test required by GACAR § 135.349(a)(2).

**E. Requalification Category.** The minimum events of the requalification checking module are dependent upon whether the pilot is re-qualifying for VFR or IFR operations and the duty position. PICs who conduct IFR operations and have completed a GACAR § 135.351 check in the past 6 months but are overdue for a check required by GACAR § 135.349 may regain qualification by completing the items listed in the columns marked “IFR COMP” in Table 4.21.7.1 for airplanes and Table 4.21.7.2 for rotorcraft. PICs overdue in respect to the requirements of GACAR § 135.351 must complete the items listed in the columns marked “INST PROF” in Table 4.21.7.1 for airplanes and Table 4.21.7.2 for rotorcraft.

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**F. Recurrent Category.** The minimum events of the “recurrent” checking module are dependent upon whether the pilot is maintaining currency for VFR or IFR operations and the duty position. PICs who conduct IFR operations and have completed a GACAR § 135.351 check in the past 6 months must complete a GACAR § 135.349 competency check to remain current. Complete those items listed in the columns marked “IFR COMP” in Table 4.21.7.1 for airplanes and Table 4.21.7.2 for rotorcraft. PICs due both a competency check and an instrument proficiency check must complete the items listed in the columns marked “INST PROF” in Table 4.21.7.1 for airplanes and Table 4.21.7.2 for rotorcraft. GACAR § 135.351 requires PICs to complete instrument proficiency checks by rotating aircraft types. When one airplane is multiengine and the other a single-engine airplane, § 135.351(f) requires that this rotation begin with the multiengine airplane.

**NOTE:** GACAR § 135.355 allows airmen and operators to consider a check conducted in the month before due or the month after due to have been accomplished in the month due.

**G. SIC Qualification in Aircraft Not Requiring an SIC.** The basic qualification module for an SIC in any operation (VFR or IFR) for which no SIC is required by regulation is either an instrument proficiency or VFR competency check in any aircraft of the same category and class and the written or oral test required by GACAR § 135.349(a)(2) for the type of aircraft involved.

**H. Listing Module Events.** To ensure that the content of the basic checking module is adequate and appropriate, the operator may choose (or the POI may require) that the minimum required events of each basic checking module be listed on the curriculum outline.

**I. Recording Checks.** Record the checks for those operators whose flight crew members get all their checks from Inspectors (single pilot, single PIC, and basic operators) on the Airman Competency/Proficiency Check Form. POIs should encourage all other operators to create specifically tailored forms to record these checks which reflect the requirements listed in the operator’s curriculum outline.

**Table 4.21.7.2. Part 135 Checking Modules—Airplanes**

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EVENTS	VFR COMP.	IFR COMP.	INST. PROF.	NOTES
WRITTEN OR ORAL TEST GACAR § 135.351			P	
GACAR § 135.349	B	B		
GROUND OPERATIONS Preflight Inspection	B	B	P	#
Start Procedures	B	B	P	#
Taxiing/Runway Operations	B	B	P	#
Pre-takeoff checks	B	B	P	#
TAKEOFF AND DEPARTURES Normal	B	B	P	
Crosswind	B	B	P	1
Instrument		P	P	2
With powerplant failure	B	B	P	ME Only
Rejected takeoff	P	P	P	3, ME Only
Short field	P	P	P**	SE Only
Only Area departure			P*	

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IN-FLIGHT MANEUVERS	P**	P**	P**	
Steep turns				
Approaches to stalls	B	P	P	10
Powerplant failure	P	P	P	
2-engine inoperative approach	P	P	P	3 & 4 Eng. Aircraft
INSTRUMENT PROCEDURES			P*	
Area arrival				
Holding			P**	
Normal ILS approach	L	P		4, 8
Engine-out ILS	P	P		8, ME Only
Coupled approach	P	P		4, 8
Non-precision approach	B	P		11
Second non-precision approach			P	11
Missed approach from an ILS			P	
Second missed approach			P	
Circling approach			P	13
LANDINGS AND APPROACHES TO LANDINGS	B	B	P	12
Normal				
Crosswind	B	B	P	5
Landing from an ILS			P	
Landing with engine-out	B	B	P	ME Only
Circling approach			P	13
Rejected landing			P	
2-engine inoperative landing	P	P	P	3 & 4 Eng. Aircraft
Short Field landing	P	P	P	SE
Only No Flap approach	P	P	P	6, 14
SEA OPERATIONS (If applicable) Normal TO & Landing	B	B	P	
Steep Turns	P **	P **	P **	
Glassy & Rough Water	P **	P **	P **	
Sailing	P **	P **	P **	
Docking	P **	P **	P **	

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NONNORMAL AND EMERGENCY PROCEDURES <i>System Malfunction</i>	B	B	P	#
Maneuver by Partial Panel	B	B	P	9
Unusual attitude Rec.	B	B	P	
Emergency Landing	B	B	P	SE Only
Instrument Approach	B			7

### NOTES TO TABLE, PART 135 CHECKING MODULES—AIRPLANES

**P** PIC.

**B** Both the PIC and SIC.

# Both PIC and SIC may be evaluated performing their assigned duties in these events simultaneously when the check pilot is not seated at the controls.

\* May be waived at the discretion of the POI and the check pilot when the check is not simultaneously conducted for certification. (Refer to Volume 9, Chapter 3, Section 2.)

\* May be waived at the discretion of the POI and the check pilot when the check is not conducted in conjunction with initial new-hire or initial equipment training.

**1** See Volume 9, Chapter 3, Section 2.

**2** See Volume 9, Chapter 3, Section 2.

**3** See Volume 9, Chapter 3, Section 2.

**4** The applicant must demonstrate the ability to use all installed equipment including APs and flight directors. In multiengine airplanes, an engine-out ILS may be substituted for the normal ILS at the option of the Inspector or check pilot administering the check.

**5** See Volume 9, Chapter 3, Section 2.

**6** See Volume 9, Chapter 3, Section 2.

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**7** POIs must ensure applicants accomplish this event in an aircraft the operator uses in revenue operations (or in an appropriately equipped FSTD.) The event should reflect a realistic course of action the pilot might take to escape from an inadvertent encounter with IFR conditions. POIs should approve methods appropriate to the aircraft, equipment, and facilities available. When the pilot is authorized to operate an appropriately equipped aircraft and the check is conducted at a location where an ILS is operational, demonstrate an ILS approach. POIs may also approve a letdown on partial panel when this would be an appropriate course of action.

**8** See Volume 9, Chapter 3, Section 2.

**9** Airplanes not having standby instrumentation.

**10** See Volume 9, Chapter 3, Section 2.

**11** See Volume 9, Chapter 3, Section 2. Any two non-precision approaches authorized by the OpSpecs may be accomplished at the discretion of the Inspector or check pilot conducting the check.

**12** See Volume 9, Chapter 3, Section 2.

**13** SICs need not be evaluated in circling approaches when the operator's procedures restrict SICs from conducting this event in revenue service.

**14** Required only for turbopropeller-powered aircraft.

**Table 4.21.7.3. Part 135 Checking Modules—Rotorcraft**

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EVENTS	VFR COMP.	IFR COMP.	INST. PROF.	NVIS/ NVG	NOTES
WRITTEN OR ORAL TEST GACAR § 135.351			P		
GACAR § 135.349	B	B		B	
GROUND OPERATIONS				B	
Preflight Inspection	B	B	P		#
Start Procedures	B	B	P	B	#
Taxiing and Ground Hover	B	B	P	B	#
Pre-takeoff checks	B	B	P	B	#
TAKEOFF AND DEPARTURES					
Normal	B	B	P	B	
Instrument		P	P		1
With powerplant failure	B	B	P	B	ME Only
Rapid Deceleration	P	P	P	B	2
Area departure			P **		
IN-FLIGHT MANEUVERS					
Steep turns			P **		
Settling with power	B	B	P	B***	
Unusual Attitude Recovery	B	B	P	B	4
INSTRUMENT PROCEDURES					
Area arrival			P **		
Holding			P **		
Normal ILS approach		B	P		3,5
Engine-out ILS		P	P		5, ME Only
Coupled approach		P	P		3, 5
Non-precision approach		B	P		7
Second non-precision approach			P		7
Missed approach from an ILS			P		
Second missed approach			P		
Circling approach			P		9
LANDINGS AND APPROACHES					
TO LANDINGS					
Normal	B	B	P	B	8
Landing from an ILS			P		
Landing with engine-out	B	B	P	B	ME Only,
Circling approach			P		9
SEA OPERATIONS (If applicable)					
Normal TO & Landing	B	B	P	B	

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NONNORMAL AND EMERGENCY PROCEDURES	B	B	P	B *	#
System Malfunction					
Recovery from IMC	B	B	B	B	4
Maneuver by Partial Panel	B	B	P		6
Instrument Approach	B	B	P		4
Power failure and Autorotation to a power recovery	B	B	P	B	SE Only
Hovering Autorotations	B	B	P	B	SE Only
Tail Rotor Failure	B	B	P		Oral Only
Dynamic Rollover	B	B	P		Oral Only
Low Rotor RPM	B	B	P		Oral Only
Anti-Torque System Failure	B	B	P		Oral Only
Confined Area/Pinnacle Operations	P		P	B	
Slope Operations	P		P	B	
Ground Hazard Recognition				B	
Brownout/Whiteout/Flat Light Operations				B	
Use of External Lighting				B	

### NOTES TO THE TABLE, PART 135 CHECKING MODULES—ROTORCRAFT

# Both PIC and SIC may be evaluated performing their assigned duties in these events simultaneously when the check pilot is not seated at the controls.

\* This will include a simulated NVIS failure with appropriate recovery procedures.

\*\* May be waived at the discretion of the POI and the check pilot when the check is not conducted in conjunction with initial new-hire or initial equipment training.

\*\*\* This maneuver may be waived at the discretion of the POI and check pilot when the check is not conducted in conjunction with initial new-hire or initial equipment training. Initial NVIS training does not require this maneuver to be demonstrated or performed.

1 See Volume 9, Chapter 3, Section 5.

2 See Volume 9, Chapter 3, Section 5.

3 The applicant must demonstrate the ability to use all installed equipment including APs and

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flight directors. In multiengine rotorcraft, an engine-out ILS may be substituted for the normal ILS at the option of the Inspector or check pilot administering the check.

**4** The event should reflect a realistic course of action the pilot might take to escape from an encounter with inadvertent instrument meteorological conditions (IMC). POIs should approve methods appropriate to the aircraft, equipment, and facilities available. Training and checking must provide emphasis on avoidance of inadvertent IFR, including the discipline and decision making required to divert, make a precautionary landing, or make an emergency transition to IFR, as appropriate to the circumstances. This event must include attitude instrument flying, recovery from unusual attitudes, navigation, ATC communications, and at least one instrument approach. If the aircraft is appropriately equipped and the check is conducted at a location where an ILS is operational, demonstrate an ILS approach. If unable to conduct an ILS approach, another instrument approach must be performed. Partial panel operations should be considered if attitude and gyroscopic heading information are available from single sources.

**5** See Volume 9, Chapter 3, Section 5.

**6** Rotorcraft not having standby instrumentation.

**7** See Volume 9, Chapter 3, Section 5. Any two non-precision approaches authorized by the OpSpecs may be accomplished at the discretion of the Inspector or check pilot conducting the check.

**8** See Volume 9, Chapter 3, Section 5.

**9** SICs need not be evaluated in circling approaches when the operator's procedures restrict SICs from conducting this event in revenue service.

**10** The accomplishment of the NVIS check does not meet the requirements of a § 135.349 "A" and "B" check, unless all requirements for VFR and IFR (competency check), if required, are completed.

### **4.21.7.19. CREDIT FOR CERTIFICATION FLIGHT CHECKS.**

**A. ATP Flight Check.** When a flight check is conducted for an ATP or for an additional type rating to an ATP, the certification flight check, if conducted in accordance with the applicable operator's program, may simultaneously be credited for a GACAR Part 121 proficiency check, a

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GACAR Part 135 competency check, or a GACAR Part 135 instrument proficiency check, as applicable.

**B. FE Certificate.** The certification flight test for an FE certificate or class rating simultaneously satisfies the GACAR Part 121 proficiency check requirement.

**4.21.7.21. CONDUCT OF PROFICIENCY AND COMPETENCY CHECKS.** Specific direction and guidance for the conduct of certification flight tests is in Volume 9, Airman Certification, Chapters 1, 3, and 4. The same standards, direction, and guidance are applicable to both Inspectors and check pilot when conducting proficiency checks, VFR competency checks, and IFR competency checks. POIs must evaluate the operator's check pilot program to ensure that check pilot are applying the same standards and are adhering to the direction and guidance for proficiency and competency checks that are applicable to certification flight checks.

**A. Waiving of Events.** Inspectors and check pilot may waive those events indicated by an asterisk in Figures 4.21.7.1 and 4.21.7.2, and Tables 4.21.7.1 and 4.21.7.2. This provision applies to all checks conducted under GACAR Part 121 and those GACAR Part 135 checks which do not involve certification. The waiver provisions of GACAR Part 61 apply only to airmen employed by GACAR Part 121 operators (see GACAR § 61.17(a)(5)).

- 1) The use of waiver authority is not automatic. Check pilots are cautioned to exercise judgment in the use of this authority. When an applicant demonstrates a high level of performance, check pilots should make liberal use of the waiver authority. When an applicant's performance only approaches the minimum acceptable standards, however, none of the events of the flight test should be waived.
- 2) Inspectors and check pilots are cautioned that some waiver provisions apply to portions of an event rather than to a whole event (for example, the stall series). Other events have specific conditions which must be fully met before waiver authority may be exercised (for example, the second non-precision approach). See the discussion of the conditions and limitations of waiver authority and the guidance on acceptable means and standards for conducting specific checking events in Volume 9, Chapter 3, Section 2.
- 3) GACAR Part 121, Appendix C contains certain restrictions on waiving events. For example, when a circling approach is required but cannot be accomplished due to traffic or other reasons, it may be waived. Circling approaches, however, may not be waived for two successive checks. POIs will observe these same provisions for GACAR Part 135 operators

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under the President's authority to determine the content of GACAR Part 135 checks.

**B. Training to Proficiency.** When a check pilot determines that an event is unsatisfactory, the check pilot may conduct training and repeat the testing of that event. This provision is made in the interest of fairness and to avoid undue hardship and expense for airmen and operators. Training may not be conducted, however, without recording the failure of these events. The quality control of a training program is accomplished, among other means, by identifying those events on checks which crew members fail. POIs must ensure the following guidance is supplied to operators and check pilot concerning the practice of training to proficiency:

- 1) Training and checking cannot be conducted simultaneously. When training is required, the check must be temporarily suspended, training conducted, and then the check resumed.
- 2) When training to proficiency is required, the check pilot must record the events which were initially failed and in which training was given.
- 3) When training to proficiency is conducted and the check is subsequently completed within the original session, the overall grade for the check may be recorded as satisfactory. When the training required to reach proficiency cannot be completed in the original checking session, the check must be recorded as unsatisfactory and the crew member entered into requalification training.
- 4) When training to proficiency is required and it is practical to do so, the remaining events of the flight test phase should be completed before training in the failed event is conducted. If it is more practical, the failed event may be repeated at the end of a logical sequence. For example, training on a stall might be conducted at altitude after all other air work has been completed, but before returning to the traffic pattern.
- 5) If, after having received training, the airman fails an event again, the failure must be recorded, and the crew member must be entered into requalification training.

**NOTE:** If for mechanical or other reasons the check cannot be completed after the failure of an event and before training and retesting can be accomplished, the check is considered terminated; however, the crew member may not serve in revenue operations until the check is successfully completed.

### 4.21.7.23. USE OF FLIGHT SIMULATION TRAINING DEVICES (FSTDs) FOR

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**PROFICIENCY AND COMPETENCY CHECKS.** The guidance of this paragraph applies to the use of FSTDs in conducting either GACAR Part 121 proficiency checks or GACAR Part 135 competency and instrument proficiency checks. The level of FSTD that can be used for any particular flight test event in these checks depends on the crew member's duty position and on the category of training. The maneuvers and procedures tables along with the introductory information in paragraphs 4.21.6.39 through 4.21.6.51 of Section 6 specify the minimum level of FSTD that can be used for a particular training event. This minimum level is also the level that can be used to test the event during a proficiency or competency check. Before beginning a proficiency or competency check, Inspectors and check pilot must determine which flight test events can be conducted in the FSTD to be used.

**4.21.7.25. THE OPERATING EXPERIENCE QUALIFICATION MODULE.** PICs and SICs in GACAR Part 121 operations who have been trained under an initial new hire, initial equipment, transition, or upgrade category of training, must acquire OE. The qualification curriculum segment outline that is applicable to these flight crew member positions must list the appropriate requirements for each duty position. GACAR Part 121 specifies the minimum flight hour requirements for these duty positions. An operator may elect to specify a greater flight hour requirement than the regulatory minimum. Inspectors must not approve any qualification curriculum segment that lists a flight hour requirement that is less than that specified by the appropriate regulation. When a pilot is actually acquiring OE, however, GACAR § 121.789(f) provides for a reduction in the minimum flight hours. These regulations specify that the minimum hours may be reduced to 50 percent of the total required flight hours by the substitution of one takeoff and landing for one hour of flight.

### A. Part 121 Minimum OE Flight Hours.

1) The minimum OE flight hours for pilots who have been trained under an initial new hire, or an initial equipment curriculum, or a PIC transition curriculum which includes training in a FSTD under, GACAR § 121.789(c)(3)(i), are as follows:

- Turbopropeller—20 hours
- Turbojet—25 hours

2) GACAR §121.789(c)(3)(ii) specifies the minimum flight hours for pilots who have been trained under a transition curriculum which does not include an approved course of training in a SIM, are as follows:

- Turbopropeller—12 hours

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- Turbojet—15 hours

3) Although GACAR Part 121 requires OE for pilots who have been trained under an upgrade curriculum, the minimum flight hours are not specified. The following minimum flight hours are recommended, however, for an SIC upgrading to PIC, and for an FE upgrading to SIC, regardless of whether or not the upgrade curriculum includes training in a FSTD:

- Turbopropeller—SIC to PIC, 8 hours; FE to SIC, 15 hours

- Turbojet—SIC to PIC, 10 hours; FE to SIC, 25 hours

4) In accordance with, GACAR § 121.434(d), the minimum OE flight hours for FEs who have been trained under an initial new hire, initial equipment, or transition curriculum are as follows:

- Turbopropeller—10 hours

- Turbojet—12 hours

**B. Conduct of OE.** All flight crew members must have successfully completed a flight check before starting OE, and are therefore considered to be qualified to serve in revenue operations, under the appropriate supervision. OE must be acquired while conducting revenue operations, except when the aircraft has not been previously used by the operator. In this case, the flight hours acquired while conducting proving flights, ferry flights, or training flights may be credited towards the OE requirement.

1) A pilot in the process of acquiring OE as a PIC under the provisions of GACAR Part 121 must occupy the appropriate pilot position and perform PIC duties under the supervision of a check pilot. The check pilot must also occupy a pilot position. In the case of a PIC trained under a transition curriculum, however, the check pilot may occupy a jump seat after the qualifying PIC has made at least two takeoffs and landings and the check pilot is satisfied that the pilot candidate is competent to perform the duties of PIC. During the time that a qualifying PIC is acquiring OE, the supervising check pilot should give instruction as needed and help to refine the pilot's proficiency as a PIC. The check pilot must determine when the PIC is fully proficient and ready to be administered an initial line check. If the

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qualifying PIC is not ready for an initial line check after the minimum flight hours have been completed, the supervision must be continued until the PIC is proficient. The check pilot should not recommend an initial line check until the check pilot is satisfied that the qualifying PIC is proficient. If the check pilot recommends the PIC for an initial line check before the minimum flight hours are acquired, the time spent conducting the line check may be credited toward the required flight hours. In all cases, however, the qualifying PIC must acquire the minimum flight hours under the supervision of a check pilot before the PIC can be released to operate unsupervised in revenue flights.

2) A pilot in the process of acquiring OE as an SIC under the provisions of GACAR Part 121 must perform the duties of an SIC in a pilot seat under the supervision of a check pilot, or must observe the performance of those duties from the jump seat. The preferred method is for the qualifying SIC to occupy the appropriate pilot position and perform the duties of an SIC. It is important that operators use the preferred method for an SIC when the SIC has received all flight training and flight testing solely in a simulator or when the aircraft involved has advanced instrument displays and computer-based systems. In either case, the qualifying SIC must acquire the minimum flight hours before being assigned as the required SIC in revenue operations. When an operator schedules a SIC to acquire OE by occupying the jump seat (not under the supervision of a check pilot) the POI should consider special en route surveillance of that SIC after the SIC is assigned as the required SIC in revenue operations. The purpose of this special surveillance is to determine whether the operator's training and flight-testing program sufficiently prepares SICs for line operations.

3) An FE in the process of acquiring OE must perform the duties of an FE at the FE station under the supervision of an FE check pilot or a qualified FE. In either case, the qualifying FE must acquire the minimum flight hours before being assigned as the required FE in revenue operations. When an operator schedules FEs to acquire OE under the supervision of a qualified FE who has not been trained as a check pilot, the POI should consider special en route surveillance of those FEs after they are assigned as required FEs in revenue operations. The purpose of this special surveillance is to determine whether the operator's training, flight-testing, and OE programs sufficiently prepare the FEs for line operations.

**C. OE Qualification Guides.** POIs should encourage operators to develop an OE qualification guide to be used by supervisors and check pilot. The purpose of the qualification guide is to ensure that a crew member systematically gains experience in all required duties the crew member will later be required to perform without supervision. Some of the typical experience events that

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might be incorporated in a qualification guide are as follows:

- Terminal security procedures
- Aircraft security and anti-hijacking procedures
- Weather forecasts and information sources
- Flight planning
- Dispatch procedures
- Cockpit setup, initialization of computers, entering present position and waypoints, confirming navigation setup
- Mass and balance computation (including last minute changes)
- Air traffic control (ATC) flow control procedures
- MEL and CDL procedures
- Pushback and powerback procedures and limitations
- Procedures for fueling and confirming fuel loads
- Familiarity with major terminal areas
- Terminal and en route communications
- Flight progress and fuel monitoring procedures
- In-flight weather watch
- Diversion procedures

**4.21.7.27. THE LINE CHECK QUALIFICATION MODULE.** Both GACAR Part 121 and 135 specify that before a pilot can serve as an unsupervised PIC in revenue operations, that pilot must have satisfactorily completed a line check. Except for requalification training, the qualification

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curriculum segment for PICs should include a line check module as a requirement for all other categories of training. Requalification training curriculums that are used to re-qualify PICs who have been unqualified for 12 months or more should include a required PIC line check module. Both GACAR Parts 121 and 135 specify that all PICs must satisfactorily complete a line check once every 12 calendar-months in at least one of the aircraft types in which the PIC is to serve. Therefore, the qualification curriculum segment for recurrent training should include a line check module for the PIC.

**A. General Direction and Guidance.** GACAR Part 121 specifies that the line check is to be given by a check pilot who is properly qualified in the particular airplane being used. In certain unique situations, such as when an operator is qualifying an initial cadre of check pilot, the only practical way of completing the line check requirement may be for an Inspector to conduct the line check and to certify the PIC's performance. GACAR Part 135 specifies that the line check may be given by an approved check pilot or a GACA Inspector. For GACAR Part 121 the amount of time flown during a line check may be credited to the OE flight hour requirement. The line check, however, should not be conducted until the OE flight hour requirement has been substantially completed. When a PIC serves in both GACAR Part 121 and 135 operations, a line check conducted in a GACAR Part 121 aircraft satisfies the GACAR Part 135 line check requirement. POIs should encourage operators to place emphasis on their line check programs. A well run line check program can provide detection of deficiencies and adverse trends and establish the need for a revision of old procedures or an initiation of new procedures. POIs should encourage operators to design and use line check forms to facilitate the collection of such information.

**B. Part 121 Line Checks.** For GACAR Part 121 operations, the line check must be conducted over at least one typical route in which the PIC may be assigned. The line check may be conducted during either revenue or nonrevenue operations.

**C. Part 135 Line Checks.** For GACAR Part 135 operations, the line check must consist of at least one route segment over an airway, an approved off airway route, or a portion of either, including takeoffs and landings at one or more aerodromes that are representative of the operator's type of operation. In certain GACAR Part 135 operations, it may not be practical to conduct a line check during revenue operations. In these cases the POI may authorize that the line check be conducted during the same flight period that the competency check is conducted. If the line check is conducted in this manner, the line check portion of this flight period must include the requirements previously discussed in this paragraph.

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**4.21.7.29. ADDITIONAL CHECKING MODULES.** Additional checking modules include flight test events that must be conducted to qualify flight crew members for special operations, such as CAT II or CAT III instrument approach procedures. Another example of an additional checking module is the requirement that a PIC be initially qualified over a route or area requiring a special type of navigation such as Performance-based navigation (PBN).

**A. Concurrent Checks.** Additional checking modules are frequently conducted concurrently with a proficiency check, competency check, or line check.

1) The regulations require additional checks, but usually do not specify the content of these checks. Since there are often several acceptable means of conducting these checks, the additional checking module outline must specify the content of these checks (see examples in paragraph 4.21.7.3).

2) When GACAR Part 121 or 135 operators choose to conduct an additional checking module in conjunction with a basic checking module, the requirements of both modules must be accomplished. A single event may, however, be credited for both modules simultaneously. For example, an operator who conducts basic checking modules and CAT II additional checking modules at the same time may combine the ILS approach requirements. The basic checking module requires a normal ILS; a manually flown, engine-out ILS; a coupled ILS; a landing from an ILS; and a missed approach from an ILS. The normal ILS and the coupled ILS may be combined in the basic checking module for a minimum of two ILS approaches. In this case, one approach must terminate in a landing and one in a missed approach. For an operator who conducts only coupled CAT II approaches, the CAT II additional checking module requires a minimum of two approaches to CAT II minimums; one approach must be to a landing and one to a missed approach. POIs may approve combining the compatible events of these two modules. In this case, the combined requirement is one-engine-out, manually flown ILS to CAT I minimums; one coupled, CAT II ILS to a landing, and one coupled, CAT II ILS approach to a missed approach.

**B. Additional Checking Modules.** Operators may choose to conduct additional checking modules separately from a proficiency check, a competency check, or a line check. It may be more practical to accomplish an additional flight test separately because of high minimum PIC requirements or because of pilot bidding practices for international routes. When an operator conducts separate checking modules, the operator must limit the use of flight crew members to those operations that do not involve the special operations until the flight crew members have

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satisfactorily completed the additional testing.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 8. Special Curriculum Segments**

**4.21.8.1. GENERAL.** This section contains direction and guidance to be used by principal operations Inspectors (POIs) for the evaluation of an operator's special curriculum segments for approval. To conduct such an evaluation, POIs should be aware of the following distinction between basic training and special training.

**A. Basic Training.** The six training categories defined in this chapter in section 1 (see paragraph 4.21.8.9) contain the basic training required for crew members and dispatchers for qualification in a specific duty position on a specified aircraft type. Training in the operations and procedures necessary to operate in the standard service volume to standard minimums is an integral part of these curriculums. This basic training must be conducted by all operators. Training methods and events are specified in regulations and are well understood in the air transportation industry.

**B. Special Training.** “Special” training is that training conducted by an operator to qualify crew members and dispatchers beyond the scope of basic training. Special training is normally required for operations which require specific authorization by the operator’s operations specifications (OpSpecs). Each operator is required to conduct only that special training required for the operator’s specific operations. Special training consists of either curriculum segments integrated into one or more of the six defined training categories or of curriculum segments grouped as an independent program. General Authority of Civil Aviation Regulation (GACAR) Part 91, Subpart D prescribes the requirements for obtaining special flight operations authorizations and Part 91, Appendix D addresses the application process and privileges of specific special flight operations authorizations. Below is a list (not all inclusive) of areas in which an operator may seek authorization:

- Low Visibility Operations
- Performance-based Navigation (PBN) Operations
- Operations with Minimum Navigation Performance Specifications (MNPS)

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- Operations in Airspace with Reduced Vertical Separation Minimums (RVSM)
- Rotorcraft Emergency Medical Service Operations (REMS)
- Rotorcraft Hoist Operations (RHO)
- Rotorcraft Operations With a Night Vision Imaging System (NVIS)
- Required Communication Performance (RCP)
- Extended-range operations with two-engine airplanes (ETOPS)
- Use of an autopilot instead of a second-in-command

**4.21.8.3. SPECIAL CURRICULUM SEGMENT CONTENT.** When evaluating an operator's training program, principal operations inspectors (POIs) must ensure that the operator's special curriculum segments contain the necessary and appropriate elements. Since operators may develop special curriculum segments to accomplish almost any objective, the curriculum content is a result of the specific objective and should be no more or less than what is required to achieve the objective. Generally, POIs should ensure that an operator's special curriculum segments have been developed from a clearly stated objective, a task analysis, and specified performance standards. Special curriculum segments must be designed to develop each crew member's knowledge, skill, and judgment in the performance of the stated tasks. Special curriculum segments must contain qualification criteria for the assessment of each crew member's ability to perform identified tasks to the specified standard. Special training curriculum segments may also be required to be conducted on a recurring basis.

**4.21.8.5. SPECIAL CURRICULUM SEGMENT APPROVAL.** POIs should follow the five-step process described in Section 2 of this chapter for the approval of special curriculum segments. The POI should evaluate an operator's initial curriculum outline to ensure that it includes appropriate segments, modules, elements, and events. The POI should evaluate the initial curriculum outline using both the applicable GACAR and this handbook. The POI may grant initial approval when the operator's outline is in compliance with such guidance. When such direction and guidance does not exist, the POI must have the operator perform a task analysis to identify the required tasks and appropriate performance standards for the special curriculum segment. The task analysis and performance standards should be submitted by the operator as supporting documentation along with the initial curriculum outline. The POI must evaluate the supporting documentation in conjunction

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with the outline before granting initial approval.

**4.21.8.7. SPECIFIC APPLICATIONS OF SPECIAL CURRICULUMS.** POIs should know of several common situations in which special curriculum segments are required. Some examples of specific applications of special curriculums follow.

**A. International Operations.** In scheduled operations, it is a requirement that flight crew members possess knowledge of those procedures and OpSpecs applicable to these operations. For PBN and MNPS operations, it may be required for flight crew members to have knowledge of specialized navigation procedures and equipment. POIs should ensure that in international operations, flight crew members are required to have supervised practice and to demonstrate their competence in these operations before performing them without supervision (see Volume 5, Chapter 1).

**B. CAT II and CAT III Approaches.** For training in CAT II and CAT III approaches, POIs must ensure that the required training includes special equipment, procedures, practice, and a demonstration of competency. While some operators have successfully integrated this training into the six defined categories of training, others have conducted this training as a separate curriculum. POIs may approve either method of organization (see Volume 5, Chapter 2).

**C. Lower-Than-Standard Minimum Takeoffs.** Before pilots may conduct takeoffs with lower-than-standard minimums, they must be given training and practice in, and have successfully demonstrated competence in, performing takeoffs in minimum authorized visibility conditions. POIs must ensure that training is given in: runway and lighting requirements; rejected takeoffs at, or near, V1 with a failure of the most critical engine; taxi operations; and in procedures to prevent runway incursions under low visibility conditions. While the preferred method of conducting this training is in a FFS, other methods may be approved by the POI for operators who do not use simulators in flight training (see Volume 5, Chapter 2).

**D. Autopilot Instead of Second-In-Command (SIC).** Pilots of general purpose, single-engine and multi-engine families of aircraft used in GACAR Part 135 operations may be authorized to conduct instrument flight rules (IFR) operations without an SIC, provided they have completed a special curriculum segment for qualification in such operations. Both the instrument proficiency check required by GACAR § 135.351 and the competency check required by GACAR § 135.349 (when conducted qualifies the applicant for IFR operations) are to be conducted using an SIC. During these checks, the applicant must demonstrate adequate crew coordination and leadership

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skills. When the applicant is qualifying for single pilot IFR operations, the applicant must also demonstrate the ability to safely conduct IFR flight without the assistance of another pilot or an autopilot.

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#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 9. Differences Training – All Training Categories**

**4.21.9.1. GENERAL.** This section contains information, direction, and guidance to be used by principal operations inspectors (POIs) when evaluating an operator's differences training program in all categories of training.

**A. Background.** Due to differences in instrumentation and installed equipment, the skills and knowledge required to operate two aircraft of the same make and model can differ. The range of differences between variations of a basic aircraft model has become extremely wide in recent years with the introduction of computerized guidance systems, electronic instrument displays, and two crew member flight crews. Crew members trained on one variant of an aircraft may require additional training to safely and efficiently operate other variants of that aircraft. Both General Authority of Civil Aviation Regulation (GACAR) Part 121 and 135 require that operators conduct "differences" training in all categories of training when the crew member is authorized to serve on more than one variant of an aircraft.

**B. Terminology.** The following terminology is defined as it applies to differences training and as it is used throughout this handbook:

1) *Base Aircraft.* A base aircraft is an aircraft or group of aircraft designated by the operator for use as a reference to compare differences with other aircraft within the operator's fleet. This comparison of differences between aircraft is for items that affect, or could affect, flight crew knowledge, skills, or abilities pertinent to flight safety. Operators designate base aircraft by the registration number, the airline nose number (such as "aircraft 801-820"), the make/model/series (such as "B747-300"), and/or other classifications which can uniquely distinguish between the operator's different aircraft pertaining to the different configurations, handling characteristics, performance procedures, limitations, controls, instruments, indicators, systems, equipment, options or modifications. A base aircraft may either be a single aircraft or a group of aircraft with the same features and may be re-designated at the discretion of the operator. Base aircraft are typically those aircraft within a fleet which the flight crews are first trained in, which the airline has the most

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number of, or which represent a target configuration for the operator to eventually use as a standard.

2) *Variant Aircraft*. A variant aircraft is an aircraft or a group of aircraft with the same features that have pertinent differences from a base aircraft. Pertinent differences are those which could affect flight safety. Typical pertinent differences are those relating to configuration, handling qualities, performance, procedures, limitations, controls, instruments, indicators, systems, equipment, options, or modifications. Variants exist within a model or series, due to differences in installed equipment. For example, a B737-200 ADV with a performance data computer system, SP-177 autopilot, dual cue flight director, and autoland is a different variant than another B737-200 ADV with a single cue flight director, SP-77 autopilot, and basic VOR/DME navigation equipment. An operator may have a number of variants in addition to a base aircraft within a fleet.

**4.21.9.3. METHODS FOR ACCOUNTING FOR DIFFERENCES.** There are several acceptable methods operators may use to account for differences. POIs should be knowledgeable of the following acceptable methods.

**A. Standardized Configurations.** The simplest and most traditional method for operators to use when dealing with differences is to avoid them by installing common instruments and equipment in each aircraft in the fleet.

**B. Separate Fleets.** Some operators treat variants of an aircraft as if they were different aircraft by developing separate curriculums for each variant and by scheduling crew members to operate only that variant of aircraft on which they have been trained.

**C. Integrated Training.** An operator can conduct differences training as an integral part of each of the six defined categories of training. When the operator chooses to use this method, POIs must ensure that an analysis of the differences between the variants of aircraft in the operator's fleet has been made and that instructional elements have been provided in each curriculum segment to account for the identified differences. POIs may approve this method when systems differences between the aircraft are minor, procedural differences are minor, and flight training is not required. Approval of integrated differences training is accomplished in conjunction with the approval of the curriculum of which it is a part. When the operator chooses this method, a differences evaluation should be submitted as supporting documentation for the initial curriculum outline.

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**D. Separate Differences Curriculum Segments.** The operator may choose to limit instruction throughout a curriculum to one specific “base” aircraft and then conduct training as to the differences present in variations of the aircraft as a separate and distinct curriculum segment. For example, an operator might designate the 100-series aircraft as the base aircraft in a B-737 transition course. Ground, integration, flight, and qualification curriculum segments would be based on this aircraft. At an appropriate point in the instruction, a distinct segment of training would be presented to cover differences in the 200-, 300-, or 400- series aircraft. This method is advantageous when the operator operates numerous variants of an aircraft.

**4.21.9.5. SPECIFIC SITUATIONS REQUIRING DIFFERENCES TRAINING.** POIs should be knowledgeable in the several situations in which differences training may be required, as follows:

- When an operator contracts for training from another party or conducts training in a leased simulator or aircraft having instrumentation or equipment different from the aircraft operated by the operator
- When an operator generates a need for differences training by introducing a variation of an aircraft into an existing fleet or by creating a variant aircraft by modifying one or more aircraft in the fleet
- When airline mergers and acquisitions generate the need for fleets to be merged in operations

**4.21.9.7. DIFFERENCES EVALUATION.** Differences training must be based on an accurate analysis of the differences in systems, equipment, and operating procedures of the aircraft involved. In 1989, the Federal Aviation Administration (FAA) Flight Standardization Boards (FSBs) began analyzing differences in variants of existing aircraft during type certification. This analysis is published in the Flight Standardization Board (FSB) Report in a Master Differences Program Requirements (MDPR) table and is publicly available for the General Authority of Civil Aviation’s (GACA’s) use. The MDPR table contains a listing of differences and differences training requirements. When an MDPR has been published which covers all variants involved, the operator’s proposed differences training program must comply with the requirements in the document. An operator preparing a training program for which an MDPR has not been published, must submit a difference analysis conducted by the operator or other qualified party (such as a manufacturer or another operator). The analysis may take any form as long as it accurately identifies all differences which are significant to the operator’s crew members. One acceptable way of constructing a differences analysis, but not the only means, is to construct a curriculum outline for the base aircraft and to identify each curriculum item in which there

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is a difference. POI's should review the MDPR reports before approving any differences program. (Table 4.21.9.1)

**Table 4.21.9.1. Example of Differences Worksheet**

DIFFERENCES EVALUATION WORKSHEET	
BASE AIRCRAFT	VARIANT AIRCRAFT
<b>Aircraft Systems Subject Areas</b>	
Hydraulic Systems <ul style="list-style-type: none"> <li>• Pumps</li> <li>• Supply</li> <li>• System A components</li> <li>• System B components</li> <li>• RAT</li> <li>• Limitations</li> </ul>	<ul style="list-style-type: none"> <li>• Pneumatic pump deleted Electric pump added</li> <li>• Same</li> <li>• Yaw damper added</li> <li>• Deleted</li> <li>• Electrical pump time</li> <li>• Yaw damper off below 100°</li> </ul>
Electrical System Module	Same
Air Conditioning Module	Same
Etc.	
<b>Systems Integration Subject Areas</b>	
Normal Procedures Module <ul style="list-style-type: none"> <li>• Loran Receiver</li> <li>• INS Operation</li> </ul>	<ul style="list-style-type: none"> <li>• Deleted</li> <li>• New procedures</li> </ul>
Non-normal Procedures Module <ul style="list-style-type: none"> <li>• Hydraulic Systems</li> <li>• Fluid Loss Procedure</li> <li>• Pump Failure</li> <li>• Fluid Overheat</li> <li>• Electrical System</li> </ul>	Contains differences <ul style="list-style-type: none"> <li>• Same</li> <li>• Different</li> <li>• Same</li> <li>• Same</li> <li>• Same</li> </ul>
<b>Flight Training Subject Areas</b>	
Normal Procedures	Contain Differences
Preflight	Contains Differences
No-Flap Approach	Contains Differences
Emergency Procedures	Contain Differences
Pressurization Loss	Same
Engine-Out Approach	Contains Differences
Etc.	

**4.21.9.9. DEGREES OF DIFFERENCES.** POIs must ensure that the methods and devices used to conduct differences training are appropriate to the degree of difference between the base aircraft and the variant aircraft. For purposes of describing degrees of difference and for defining acceptable training methods, five levels of differences have been defined (Levels A–E). These levels are compatible with those described in MDPRs but are discussed here primarily for guiding POIs in

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approving differences training programs that are not based on MDPRs.

**A. Level A Differences.** Level A differences are those differences which the crew member needs to be aware of, but which have little effect on systems operations. For example, an engine starter on one variant aircraft has different time limits but does not have differences in controls, indicators, function, or procedures. Self-instruction methods such as highlighted pages of operating manuals or training bulletins are acceptable for these differences. At the Level A of differences, testing may not be required or may be delayed until the next period of recurrent training. Among the several appropriate means of conducting such testing are open book tests, verbal quizzes, and computer-based instruction (CBI). Once such differences are incorporated into the operator's aircraft operating manual, there is not usually a requirement for currency events associated with A Level Differences.

**B. Level B Differences.** Level B differences are those differences in systems, controls, and indicators that have only minor procedural differences. Level B differences are of great enough degree to require formal training in either general operating subjects, aircraft systems, or both, but are not of great enough degree to require systems integration training. An example of a Level B difference might be a fuel system with additional fuel tanks, pumps, and gages. Procedural differences are limited to the operation of transfer valves and pumps while an aircraft is in cruise flight. Appropriate instructional methods for Level B differences include; but are not limited to, tape slide/presentations, lectures, and CBI. The testing that is appropriate to Level A differences is also appropriate to Level B differences; however, testing must be conducted immediately after training.

**C. Level C Differences.** Level C differences are those differences of great enough degree to require a systems integration training module but that are not of great enough degree to require actual flight training (see paragraph 4.21.5.19 in Section 5 of this chapter for a definition and description of integration training). An example of a Level C difference is the installation of a flight management system (FMS) computer. Appropriate training and testing methods in the general operating and systems training modules are the same as those used for Level B differences. Appropriate training devices in the integration module are dedicated systems trainers or training devices of level 4 or greater. Testing methods appropriate to Level C differences are demonstrations of skill in the procedures affected by the difference. In the case of the installation of an FMS computer, testing might consist of preflight programming of the computer and a demonstration of its use in navigation, climbs, and descents. In this case, the qualification curriculum segment should also contain supervised operating experience.

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**D. Level D Differences.** Level D differences are those differences for which there is a requirement for flight training modules but not for high fidelity simulation for landings. When Level D differences exist between two aircraft, general operating training modules, systems training modules, and integration training modules may be required. An example of a Level D difference might be the installation of an electronically integrated flight instrumentation display. Aircraft operations using such a display are required to contain flight training in most phases of flight, except landings. Level 6 or greater flight training devices are appropriate for conducting Level D differences training and qualification modules. The testing required consists of applicable events of a GACAR Part 121 proficiency check or a Part 135 competency check.

**E. Level E Differences.** Level E differences are those differences for which there is a requirement for flight training, including landing events. An example of a Level E difference is the installation of a STOL (short takeoff and landing) kit on an aircraft resulting in a very different flare and landing attitude. A Level C or higher (Phase II) FFS, or an airplane is required for flight training in Level E differences. The testing required in Level E differences consists of the applicable events of a GACAR Part 121 proficiency check or a GACAR Part 135 competency check.

**4.21.9.11. RECURRENT DIFFERENCES TRAINING AND CURRENCY EVENTS.** When operators schedule crew members on multiple variants of an aircraft, some form of differences training must be included in the recurrent training curriculum. The amount and type of required training depends on the degree of difference involved and the operator's circumstances. Levels A and B differences should be reviewed within recurrent ground training curriculum segments. Levels C, D, and E differences require some degree of proficiency testing in a flight simulation training device (FSTD) or aircraft. Recurrent differences training and testing can be reduced when the operator adopts a system to ensure that crew members remain current in all variations of the aircraft operated. For example, when a crew member is operating aircraft equipped with servo-mechanical and CRT cockpit displays, currency could be expressed by the operator in terms of the number of flight legs in each variant of the aircraft each quarter.

**4.21.9.13. APPROVAL PROCESS.** The approval process for differences training follows the five-step process described in Section 2 of this chapter. The operator must submit an outline of the differences training program. This outline should contain appropriate modules and elements. Before the POI may grant initial approval of the training program, the operator must also submit documentation supporting the differences analysis. The documentation may consist of a reference to other documents available to the POI, such as the FSB Report. The documentation may also be a differences analysis

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prepared by the operator or other qualified party. When the operator chooses to use the integrated method of training, differences training appears in the outline as differences modules in the appropriate curriculum segment. When the operator conducts differences training as a separate and distinct curriculum segment, all differences modules are grouped in that segment. In either case, the POI's approval should be predicated on the operator meeting the following required criteria:

- Differences analysis is complete and accurate (but not necessarily in great detail)
- Outline contains the appropriate instructional elements to account for the differences identified in the analysis
- The appropriate modes of instruction and devices to conduct the training are used

**4.21.9.15. SEAT-DEPENDENT TRAINING.** Pilots operating aircraft from the left and right pilot seats are frequently confronted with special skill and training requirements. The differences in crew duties and skill requirements vary from insignificant to highly significant in various makes and models of aircraft. For this reason, POIs must evaluate an operator's seat dependent training requirements on a case-by-case basis. POIs may require that operators use a differences evaluation (as described in this section) for making this determination.

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#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 10. Flight Crew Recurrent Training Curriculums**

**4.21.10.1. GENERAL.** This section contains information, direction, and guidance to be used by principal Operations inspectors (POIs) in the evaluation of an operator's recurrent flight crew training curriculums. The information covered includes the objectives and content of these recurrent training curriculums. The recurrent category of training is conducted for flight crew members who have been previously trained and qualified by the operator, who are continuing to serve in the same duty position and aircraft type, and who must receive recurring training and/or checking within a specific eligibility period to maintain currency. GACAR Parts 121 and 135 flight crew recurrent curriculums contain the following curriculum segments: aircraft ground training, general emergency training, flight training, and qualification. Special operations and differences training curriculum segments must also be included, when applicable.

**4.21.10.3. OBJECTIVE OF RECURRENT TRAINING.** The objective of recurrent training is to ensure that flight crew members continue to be knowledgeable of, and proficient in, their specific aircraft type and duty assignment. Periodic recurrent training also provides operators with an opportunity to introduce crew members to changes in company operating procedures, in crew member duties and responsibilities, and in developments within the operating environment and aviation industry.

**A.** POIs must ensure that the operator conducts the required number of hours of training for each cycle of recurrent training, and within the time period specified by the GACARs. Furthermore, POIs must take into account that although an operator may have satisfied the GACARs, the operator may not have satisfied the objective. The POI can consider the objective to have been met when the crew member is able to perform at the required standard of proficiency immediately before entering the next cycle of required training.

**B.** POIs shall review recurrent training curriculum segments to ensure that the subject matter is appropriate, and of the proper scope and depth. The training given by the operator in each segment must meet the objective of that segment. Since there are limits as to the amount of recurrent training operators can reasonably conduct, POIs must ensure that operators use the

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time allocated for recurrent training efficiently and effectively. POIs and operators should carefully consider the following:

- 1) The GACARs require that all required subjects and topics in initial training be covered in recurrent training. Crew members must remain proficient in these subjects as long as they continue to serve in the aircraft and crew position. Operators must give sufficient training to ensure that crew members continually remain proficient. The training required to meet this objective must be given even if it is in excess of the scheduled hours or listed topics.
- 2) The GACARs do not require that every subject and topic of training be reviewed during each cycle of training. POIs should encourage operators to construct recurrent training outlines with different topics and elements emphasized in each cycle of training, so that when an element is addressed, it may be addressed in adequate depth.
- 3) Recurrent training curriculum segments may not contain material that is not pertinent to flight crew aircraft training, ground training, flight training, and general emergency training requirements (such as security training—a separate training requirement and curriculum segment).
- 4) Recurrent training syllabuses (not necessarily curriculum outlines) should be revised frequently (preferably annually). Operators must remove any unnecessary, outdated, superfluous, or inappropriate material and replace it with current and timely material. POIs should encourage operators to construct recurrent training curriculum segment outlines in a manner that allows for training syllabus variation in subsequent cycles of training, while not necessitating a new program approval (see paragraph 4.21.10.7 in this section).
- 5) POIs shall encourage operators to use pretesting to identify areas in which crew members are deficient. While operators do not have to train in areas in which crew members demonstrate competence, they must, however, be able to identify areas with deficiencies and conduct training to proficiency in those areas.

**4.21.10.5. TRAINING/CHECKING MONTH AND ELIGIBILITY PERIODS.** Both GACAR Part 121 and 135 require that for flight crew members, they must have completed various recurrent training and checking events within 12 calendar months. When an operator adopts a modular approach for recurrent training, all such training elements and events must be grouped into specified modules to be administered and recorded as a recurrent training curriculum segment. When an operator does not adopt a modular training approach, records must be kept of each airman's accomplishment for each

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element of required training and each element or event must be scheduled separately. POIs should use the following direction and guidance when reviewing an operator's recurrent training and checking events.

**A. Training/Checking Month.** The training/checking month is that calendar month during which a flight crew member is due to receive recurrent training. Calendar month means the first day through the last day of a particular month. PICs conducting GACAR Part 121 operations or GACAR Part 135 IFR are also due a recurrent training or checking module 6 months after the training/checking month.

1) *Designating the Training/Checking Month.* When a crew member completes an initial, transition, upgrade, or requalification training program within a 3-calendar-month period, the month in which the qualification curriculum segment is completed is then considered to be that crew member's training/checking month. If the training has been completed within the 3-month period, the operator may make a single record of the entire curriculum without noting when individual events occurred. Subsequent scheduling of recurrent training may then be based on the training/checking month. If the time taken to complete initial, upgrade, transition, or requalification training has exceeded 3 calendar months, however, the operator must record and schedule the accomplishment of recurring events separately.

**NOTE:** The requirement that PICs of turbojet aircraft must accumulate 100 hours in command is not considered for the purpose of establishing the 3-month period.

2) *Adjusting the Training/Checking Month.* Operators may adjust a crew member's training/checking month by administering a period of recurrent training and qualification. When training is accomplished before it is due, operators must ensure that all requirements are accomplished within the 12 calendar months allowed by the regulations. Requirements are sometimes omitted when an airman completes an initial-equipment, transition, or upgrade training curriculum at some time other than the previous eligibility period. When a training/checking month is adjusted, the reason for the adjustment must be noted in the airman's record. A coding system for this adjustment may be used for computerized recordkeeping systems.

3) *Requalification.* When an airman's qualification has lapsed due to not completing recurrent training or checking requirements, that airman must complete requalification training (See section 11 of this chapter). When an airman is entered into requalification

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training, a record of the reason for entry must be placed in the airman's record. The operator may establish a new training/checking month or retain the airman's original training/checking month after the airman successfully completes the requalification training.

**B. Eligibility Period.** The eligibility period is a 3-month period comprised of the calendar month before the month in which training is due, the month in which training is due, and the calendar month after the month in which training is due. In both GACAR Part 121 and Part 135 operations, required recurrent training and checking that is completed any time during the eligibility period is considered to have been completed during the month in which training is due. A crew member that has not completed all recurrent training or checking requirements in the month due may be scheduled and may serve in revenue service during the remainder of the eligibility period, but not thereafter. A flight crew member who fails to complete all required training and qualification modules within the eligibility period must complete requalification training before serving in revenue operations.

### **4.21.10.7. RECURRENT AIRCRAFT GROUND TRAINING CURRICULUM SEGMENTS.**

POIs must ensure that an operator's recurrent aircraft ground training consists of instruction in three subject areas: general operational subjects (including aerodrome ground operational safety, aircraft systems and systems integration training. Differences and special operations training (such as windshear) may also be required. GACAR §§ 121.919 and 135.409 require that recurrent aircraft ground training must contain instruction in the same subjects required for initial training. This requirement does not mean that each element of initial training must be re-accomplished during each period of recurrent training. It means that pertinent subject areas must be re-accomplished often enough to ensure that crew members remain competent in the performance of their assigned duties. The regulations also require that certain subjects, such as emergency training be covered each year.

**A. Training Hours.** Ground training hours must be specified in the recurrent training curriculum segment. The number of training hours required for various aircraft and the approval of training hours are discussed in section 5, paragraph 4.21.5.9 of this chapter. Operators may be required, however, to conduct more than the minimum number of hours specified by the regulations to achieve the training objective. GACAR §§ 121.919(b)(2) and 135.409(b)(2) require that training in all subject elements which are required in initial aircraft ground training must be given "as necessary" in recurrent training. A recommended means of constructing recurrent training segments is to focus on one or two training modules within each subject area. During recurrent training, additional training modules may be accomplished at subsequent cycles of training until all of the areas of initial training have been completely reviewed. A complete cycle

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should not exceed 3 years.

**B. Differences and Special Operations Training.** When either aircraft differences training or special operations training is applicable, it must be included in recurrent training curriculums. This training may either be presented as a separate and distinct curriculum segment or the training may be integrated into other modules. An effective way for an operator to conduct differences training is to discuss the differences in individual systems and procedures as an integral part of the training. When special operations are conducted, special curriculum modules are normally required as opposed to integrating the training into other segments. Recurrent training should also include updated information on equipment, operational practices and procedures, information from accidents and incidents, and on areas which require emphasis as a result of line and proficiency check evaluations.

**4.21.10.9. WRITTEN OR ORAL TESTING.** POIs must ensure that the following written or oral testing requirements are in the operator's recurrent training curriculum.

**A. General.** Written or oral testing is a required module of the recurrent flight checks for both GACAR Part 121 and Part 135 curriculums. This testing may either be conducted in conjunction with the flight check module or separately. The testing must be accomplished within the airman's eligibility period.

**NOTE:** Although operators may use computer-based instruction, programmed instruction, or "open book" instruction and testing to obtain a reduction in ground training hours, this training/checking is not intended to be a substitute for the testing required in the qualification segment.

**B. Composition of Written and Oral Test Modules.** The oral or written test module must contain three distinct sets of test elements.

1) The first set of test elements is general in nature and covers the applicable provisions of GACAR Part 61, 91, 121 and 135, the operator's OpSpecs and the operations manual (OM). This segment only has to be completed once during each qualification cycle and does not need to be repeated if the crew member is qualifying on more than one aircraft.

2) The second set of test elements includes aircraft systems, operating procedures, mass and balance, aerodrome ground operational safety, and performance data relative to each specific make and model of aircraft. This segment of the test module must be completed on each make

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and model aircraft on which the airman is to serve. When the airman is qualifying to serve on more than one variation of an aircraft, a written or oral differences test segment is also required.

3) The third set of test elements consists of special or unique operations. Special operations testing may be included in the general or aircraft specific segments, as appropriate.

### **4.21.10.11. RECURRENT GENERAL EMERGENCY TRAINING CURRICULUM**

**SEGMENTS.** Both GACAR Part 121 and Part 135 operators are required to conduct recurrent general emergency training. This curriculum segment is separate from the aircraft ground recurrent training curriculum segment. Recurrent general emergency training consists of emergency situation and emergency drill training modules. Section 4 of this chapter contains additional direction and guidance on the scope and content of general emergency training modules. Recurrent general emergency training for GACAR Part 121 consists of all the items required by GACAR § 121.907. Recurrent general emergency training for GACAR Part 135 consists of all the items required by GACAR § 135.389. This training must be conducted every 12 months, typically at the same time recurrent aircraft ground training is conducted.

**A.** The emergency situation training modules that are part of the recurrent general training curriculum segment must include at least the following elements:

- Rapid depressurization (if applicable)
- Fire in flight (or on the surface) and smoke control procedures
- Ditching and evacuation situations
- Illness, injury, or other abnormal situations involving passengers or crew members

**B.** GACAR Part 121 crew members must complete emergency drill training at least once every 24 months. During alternate 12-month periods, training may be accomplished by the operator using pictorial presentations or demonstrations. GACAR Part 135 crew members must complete emergency drill training every 12 months. The emergency drill training modules that are part of the recurrent general emergency training curriculum segment must include at least the following events:

- Operation of each type of emergency exit in the normal and emergency modes

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- Operation of each type of hand-held fire extinguisher
- Operation of each type of emergency oxygen system
- Donning, use, and inflation of each type of life preserver and the use of other flotation devices (if applicable)
- Ditching procedures (if applicable) including cockpit preparation, crew coordination, passenger briefing and cabin preparation, the use of lifelines, and the boarding of passengers and crew members into a life raft or slide raft

**C.** The following illustration (Table 4.21.10.1) clarifies the chronological order of recurrent general emergency training requirements:

**Table 4.21.10.1. Part 121 Recurrent General Emergency Training Timetable**

<b>TYPE OF RECURRENT GENERAL EMERGENCY TRAINING REQUIRED</b>	<b>MONTHS SINCE FIRST GENERAL EMERGENCY TRAINING CURRICULUM SEGMENT WAS COMPLETED</b>			
	<b>12 MONTHS</b>	<b>24 MONTHS</b>	<b>36 MONTHS</b>	<b>48 MONTHS</b>
Emergency Situation Training	X	X	X	X
Emergency Drill (either hands-on or pictorial demonstration)	X		X	
Emergency Drill (hands-on required)		X		X

**4.21.10.13. RECURRENT FLIGHT TRAINING AND QUALIFICATION CURRICULUM SEGMENTS—PART 121** When determining the various acceptable means that an operator may use to construct recurrent flight training and qualification curriculum segments, POIs should use the direction and guidance that follows.

**A.** GACAR § 121.835(c)(1)(i) requires that all pilots complete a flight training curriculum segment every 12 calendar months in each airplane in which the pilot is to serve. This regulation also requires that the applicable flight test (as prescribed in GACAR § 121.797) be accomplished. The flight training and flight test requirements are separate and distinct but are both due in the pilot's training/checking month.

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**B.** GACAR § 121.835(c)(iii) requires PICs to complete a flight training module annually in addition to the module conducted in the airman's training/checking month. This module is due in the calendar month 6 months after the training/checking month.

**C.** GACAR § 121.835(c)(2) allows a course of simulator training described under GACAR § 121.859(b) to be substituted for alternate periods of recurrent flight training. A course of flight training in a full flight simulator (FFS) under GACAR § 121.859(b)(1) consists of 4 hours at the controls practicing at least the procedures, maneuvers, and events in Appendix C. A course of flight training in a simulator under GACAR § 121.859(b)(3) consists of line oriented flight training (LOFT).

**D.** GACAR § 121.835(c)(2) permits an operator to conduct a proficiency check instead of recurrent flight training but does not authorize training instead of a required proficiency check. This provision is not intended to allow perpetual substitution of checking for training. POIs must emphasize that training is of primary importance, and checking is the means of verifying that training has been adequate. POIs shall ensure that operators conduct adequate refresher and remedial flight training in addition to conducting the required checks. The provision allowing for the substitution of checks for training is intended to allow the following:

- Realignment of a crew member's training/checking month
- Relief for crew members re-qualifying after losing qualification
- Necessary flexibility for operators when realigning and revising training programs

**E.** GACAR § 121.797 requires that a PIC must have completed a proficiency check within the last 12 calendar months and either a proficiency check or one of the FFS courses of training described under GACAR § 121.859(b) within the last 6 calendar months.

**F.** GACAR § 121.797 requires a SIC to have completed a proficiency check or FFS training described under GACAR § 121.859(b) every 12 calendar months. A SIC must also have completed a proficiency check or LOFT within 24 calendar months.

**G.** GACAR § 121.797 states that within the previous 6, 12, and 24 calendar months, crew members must complete specified requirements. GACAR § 121.839, however, allows an additional, calendar-month grace period for crew members to complete these requirements.

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**H.** Table 4.21.10.2 contains a summary of the methods that a GACAR Part 121 operator may use to comply with the combined recurrent qualification requirements of the cited regulations.

**Table 4.21.10.2. Methods For Combining Recurrent Training, Part 121**

<b>Months</b>	<b>0</b>	<b>6</b>	<b>12</b>	<b>18</b>	<b>24</b>
<b>PIC</b>	P	P	P	P	P
	P	T or L	P	T or L	P
	P	P	L or T	P	L or T
<b>SIC</b>	P		P		P, L, T
	P		L		P, L, T
	P		T		P or L

**P** = Proficiency check in an aircraft or FFS

**L** = LOFT

**T** = Simulator training Months

For recurrent training, flight engineers must have completed a proficiency check within 12 calendar months. When a crew member flies more than one aircraft type, the training/checking month for each subsequent airplane is the same calendar month that is one year after the original check on that type of aircraft. Operators normally find it advantageous to align the training/checking month on the second airplane 6 calendar months after the training/checking month on the first airplane. This arrangement permits the competency check for the second airplane to simultaneously count as the instrument proficiency check for the first airplane.

### **4.21.10.15. RECURRENT FLIGHT TRAINING AND QUALIFICATION CURRICULUM SEGMENTS - PART 135.**

The recurrent qualification check requirements for pilots in GACAR Part 135 operations are as follows:

A. Each pilot serving in airplanes of the multiengine, general purpose aircraft family must have completed a competency check in one model of airplane of the equivalent aircraft family within 12 calendar months. A competency check in one airplane of an equivalent aircraft family qualifies the pilot in all airplanes of that family.

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**B.** Each pilot serving in single-engine airplanes other than turbojets must have completed a competency check in any make and model of the aircraft family within 12 calendar months. Only one competency check is required to qualify the candidate in all single-engine airplanes of this family.

**NOTE:** The provisions of previous subparagraphs B and C do not relieve a pilot from having to complete recurrent differences training and that portion of the oral or written competency test applicable to each make, model, and variation of the airplane that the pilot will operate as required by GACAR § 135.349(a)(2).

**C. Instrument Proficiency Check.** GACAR § 135.351 requires a PIC conducting IFR operations to have completed an instrument proficiency check in one aircraft in which the pilot serves, and within the preceding 6 calendar months. The competency test for IFR operations as described in section 7 of this Chapter satisfies the requirements of an instrument proficiency check. A PIC is due an instrument proficiency check in the calendar month 6 calendar months after the training/checking month.

- 1) GACAR § 135.351 specifies that the instrument proficiency check consists of those maneuvers and events required for original issuance of the certificate required for the operation being conducted (either ATP or commercial/instrument). The events required on an instrument proficiency check are discussed in Section 7 of this chapter.
- 2) GACAR § 135.351 allows a pilot operating both single-engine and multiengine aircraft to alternate the instrument-proficiency checks in the two classes of aircraft and be considered qualified in both classes. The pilot must, however, have completed an IFR check in a multiengine aircraft before beginning the alternating sequence. This provision does not, however, relieve the pilot from having to accomplish a competency check (as discussed in section 7 of this chapter) in each family of aircraft or, when required in each individual aircraft, once every 12 calendar months (see Section 7, paragraph 4.21.7.25).

**NOTE:** GACAR § 135.351 was written before competency checks for IFR operations were required for operators to satisfy the requirements of GACAR §§ 135.351 and 135.349. The provision for alternating checks has little practical application under the current requirements.

**D. Autopilot Instead of SIC.** Before a PIC may be authorized to conduct IFR operations with an

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autopilot instead of an SIC, the PIC must satisfactorily demonstrate this ability once every 12 calendar months. This demonstration should be conducted in conjunction with an IFR competency check.

**E. Multiple Currency.** When a pilot flies two or more aircraft of different families or aircraft requiring individual qualification, the pilot's training/checking month for each airplane or family of airplanes is the same calendar month 1 year after the original qualification on that aircraft or aircraft family. Operators will usually find it advantageous to align the training/checking month for the second airplane 6 calendar months after the training/checking month for the first airplane. This arrangement eliminates the need for separate instrument proficiency checks.

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#### **CHAPTER 21. FLIGHT CREW TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS FOR PARTS 121 AND 135**

##### **Section 11. Flight Crew Requalification Training Curriculums**

**4.21.11.1. GENERAL.** This section contains information, direction, and guidance to be used by principal operations inspectors (POIs) for the review and approval of requalification training curriculums. In this section, a formal definition of requalification training is given; a definition is not included in the regulations. Since crew members qualified for operations under General Authority of Civil Aviation Regulation (GACAR) Part 121 and 135 do sometimes lose their qualification, it is useful for the operators to have a definition of requalification training, including the reasons for it and its objectives.

**A. Definition.** For the purposes of this handbook, requalification training is defined as that category of training conducted specifically to restore a previously qualified crew member to a qualified status. The operator's requalification training curriculum must contain the specific duty position and aircraft type for the applicable operations (in some cases, aircraft family for certain GACAR Part 135 operations). To be eligible for training in a requalification curriculum, a crew member must have been previously qualified in that aircraft type and duty position and have subsequently lost that qualification.

**B. Reasons for Crew Members Losing Qualification.** A crew member may lose qualification status and become "unqualified" for any of the following reasons: failure to accomplish all of the recency of experience requirements required by the regulations (noncurrent); failure to complete recurrent training within the eligibility period established by the regulations (becoming overdue); or failure of a checkride (becoming disqualified). A crew member may be simultaneously qualified in one aircraft or duty position and unqualified in another.

**NOTE:** If a crew member fails a checkride in one aircraft, that crew member cannot fly in another aircraft until the crew member's qualification has been re established.

**C. Objectives of Requalification Training.** Crew members meet requalification training objectives by completing a combination of aircraft ground, flight, and qualification curriculum segments, as applicable. The training and qualification curriculum segments needed for a crew

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member's requalification are determined by the reasons for, and the length of, the crew member's unqualified status. A crew member's requalification after a loss of currency may be as simple as re accomplishing the currency events in which the crew member is delinquent, such as landings. Requalification, however, may be as complex as the crew member having to accomplish the events in the initial equipment category of training when the crew member has been unqualified for an extended period of time. Remedial training after disqualification should be tailored to the specific case.

**D. Aerodrome Ground Operational Safety.** Training in runway safety and the specific standard operating procedures (SOP) contained in Federal Aviation Administration (FAA) Advisory Circular (AC) 120 74 (as amended), GACAR Part 91, 121, 125, and 135 Flight Crew Procedures during Taxi Operations and AC 91 73 (as amended), Part 91 and Part 135 Single Pilot Procedures during Taxi Operations should be incorporated in requalification training conducted by operators under GACAR Part 121 and 135.

**4.21.11.3. REESTABLISHING LANDING CURRENCY OF PART 121 PILOTS.** GACAR § 121.769(a) requires that each pilot operating under GACAR Part 121 must have made at least three takeoffs and three landings in the aircraft type in which the pilot is to serve in the previous 90 day period. A pilot who fails to meet this requirement is unqualified to serve in GACAR Part 121 operations. In such a case, the qualification curriculum segment for requalification training consists of either an experience module or a basic qualification module (proficiency check) in accordance with GACAR Part 121 and Section 7 of this chapter. Aircraft ground training curriculum segments and flight training curriculum segments are usually not required. POIs must ensure that the operator's training modules for requalification meet the requirements that follow.

**A.** A recency of experience qualification module may be used which contains at least three takeoffs, three landings, and the following:

- A takeoff and landing with a simulated failure of the most critical powerplant
- A landing from an ILS approach to the lowest ILS minimums the pilot is authorized in revenue operations
- A landing to a full stop

**B.** The recency of experience qualification module may be accomplished in one of the following devices:

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- An aircraft, in non-revenue operations, under the supervision of a check pilot
  - An approved Level B, C, or D full flight simulator (FFS) under the supervision of a check pilot
  - In a Level A FFS under the supervision of a check pilot (The pilot must have previously logged 100 hours in the same type aircraft. The pilot must also be subsequently observed during the first two landings in line operations by a check pilot. The pilot may not conduct approaches to minimums lower than CAT I, as specified in the operator's Operations Specifications (OpSpecs), until this requirement has been satisfied. The landings must be made within 45 days after completion of simulator training.)
- C. When a FFS is used to re establish currency, all flight crew positions must be occupied by individuals qualified in the operator's procedures and in the specified duty positions. The crew member's level of qualification does not have to be equivalent to that level required of a crew member serving in revenue operations. The FFS must be operated in a normal flight scenario. Repositioning is not allowed.
- D. The check pilot must certify to the proficiency of the pilot and enter that certification into the pilot's records.

**4.21.11.5. REESTABLISHING CURRENCY OF PART 121 FLIGHT ENGINEERS.** GACAR § 121.781 requires that flight engineers (FEs) must have acquired at least 50 hours of flight time as FEs in the preceding 6 months in the airplane type in which they are to serve. An FE who becomes noncurrent for failing to meet this requirement must re establish currency by completing a basic qualification module (proficiency check) conducted either by an FE check pilot or by an Inspector, in accordance with Section 7 of this chapter. The check may be conducted in an airplane in nonrevenue operations, or in a FFS, as defined in Volume 9, Chapter 4.

### **4.21.11.7. REESTABLISHING LANDING CURRENCY OF PART 135 PILOTS.**

A. GACAR § 135.347 requires that each pilot in command (PIC) operating under GACAR Part 135 accomplish at least 3 takeoffs and 3 landings in an aircraft of the same category and class within the preceding 90 days. Additional requirements apply to the following specific situations:

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- 1) If a PIC is required to hold a type rating, the PIC must have accomplished the three landings in that type of airplane.
- 2) If night operations are authorized, a PIC must have made three takeoffs and landings during the period extending from 1 hour after sunset to 1 hour before sunrise, in an aircraft or in a Level B, C, or D FFS, of the same category and class within the preceding 90 days.
- 3) If an airplane is equipped with a tailwheel, a PIC must have made three takeoffs and landings to a full stop in an airplane equipped with a tailwheel in the preceding 90 days.

**B.** A PIC who has become unqualified because of a failure to accomplish the required landings may re-qualify by completing either a basic VFR or IFR qualification module (competency check) as specified in GACAR § 135.349 and Section 7 of this chapter, or by completing a recency of experience qualification module. A VFR recency of experience qualification module consists of three takeoffs and three landings. One of these landings must be to a full stop. If the PIC is to operate a tailwheel airplane, the three landings must be to a full stop and completed in an airplane with a tailwheel. POIs must ensure that the operator's IFR recency of experience qualification module contains the following:

- A takeoff with a simulated failure of the most critical powerplant (when using a multiengine aircraft that has the performance characteristics which allow this event to be accomplished safely)
- A landing from an ILS approach to the lowest ILS minimums that the pilot is authorized to use in revenue operations
- A landing with the simulated failure of the most critical powerplant (when using a multiengine aircraft)
- At least one landing to a full stop

**C.** The recency of experience qualification module may be accomplished in the following ways:

- 1) A PIC may re establish currency by performing the three takeoffs and landings in an aircraft of the same category and class. When the PIC is required to have a type rating to command the aircraft, the landings must be in that aircraft type. These landings do not have to be supervised by a check pilot. The PIC must record the completion of the required

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landings and provide the operator with a record copy to be kept on file. A safety pilot is required for the IFR module.

- 2) The pilot may conduct at least three takeoffs and three landings in an approved Level B, C, or D FFS under the supervision of a check pilot.
- 3) The pilot may conduct three takeoffs and three landings in a Level A FFS under the supervision of a check pilot. When a Level A FFS is used, the pilot must have previously logged 100 hours in the same airplane type. The pilot must be subsequently observed by a check pilot while conducting two landings. If the landings are made in revenue service they must be the first two landings the pilot conducts. The landings must also be conducted within 45 days after the completion of simulator training.

**D.** When a FF is used to re establish landing currency for a pilot, all required flight crew positions must be occupied by individuals qualified in the operator's procedures and in the specific duty position. The individuals participating do not have to be qualified to serve in revenue operations. The FFS must be operated in a normal flight scenario. Repositioning is not allowed.

**E.** The check pilot must certify to the proficiency of the pilot. The operator must enter that certification into the pilot's records along with the reason that requalification was required.

**F.** GACAR Part 135 does not specify landing currency requirements for SICs. POIs should encourage operators to establish a minimum requirement that SICs must perform at least three landings within the previous 90 days in an aircraft of the same category and class. SICs in IFR operations must, however, have flown and logged six hours of instrument flight (three of which may have been in an approved FSTD) and six instrument approaches in the preceding six calendar months in accordance with GACAR§ 61.17. SICs in IFR operations who fail to meet the instrument currency requirements may re-qualify either by accomplishing a recency of experience module or an SIC, basic IFR qualification module in an aircraft of the same category in which revenue operations are to be conducted. The recency of experience module must consist of the hours and events in which the SIC is delinquent. The events required in an SIC, basic IFR, qualification module are specified in Section 6 of this chapter. The basic qualification module may be administered by an Inspector or check pilot. The aircraft and FTSDs specified in Tables 4.21.6.5 through 4.21.6.7 in Section 6 of this chapter may be used to accomplish these events, flight hours, and checks. When requalification is accomplished by means of a basic qualification

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module, the check pilot conducting the check must certify to the competency of the airman. When the airman re-qualifies by accomplishing the required hours and events without the supervision of a check pilot, the airman shall record that accomplishment in a logbook and supply a record copy to the operator. The operator is responsible for keeping a record of these events.

**4.21.11.9. REQUALIFICATION FOR FAILURE TO COMPLETE RECURRENT TRAINING DURING THE ELIGIBILITY PERIOD.** A requalification curriculum segment is required when a crew member fails to complete recurrent training hour during a pre established eligibility period. The minimum amount of training required in each segment of the curriculum is determined by the length of time the crew member has been unqualified. Crew members must be trained to proficiency and complete a qualification module before being returned to revenue service. Requalification curriculum outlines must specify minimum training hours and events. Both GACAR Part 121 and 135 allow crew members to be trained to proficiency. In each individual case, more or less training hours called for in the curriculum outline may be required. Tables 4.21.11.1 and 4.21.11.2 contain the requalification requirements for GACAR Part 121 and 135 crew members that have exceeded their respective eligibility periods for required training or checks.

**Table 4.21.11.1. Part 121 Requalification Curriculums Flight Crew Member Overdue Training**

Time Past Month Due	RGT SEGMENT	RFT SEGMENT	QUALIFICATION SEGMENT
Up to 12 calendar months	The portion of RGT not accomplished when due.	The elements not accomplished when due.	The modules not accomplished in the eligibility period: PC, LC, or special.
12 to 35 months	16 hours	8 hours	All qualification modules of the transition curriculum.
36 to 59 months	24 hours	16 hours	All qualification modules of the transition curriculum.
More than 59 months	– SAME AS INITIAL EQUIPMENT TRAINING –		

**KEY:**

RGT - Recurrent Ground Training, PC - Proficiency Check

RFT - Recurrent Flight Training, LC - Line Check

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**Table 4.21.11.2. Part 135 Requalification Curriculums Flight Crew Member Overdue Training**

TIME PAST MONTH DUE	RGT SEGMENT	RFT SEGMENT	QUALIFICATION SEGMENT
Up to 12 calendar months	The portion of RGT not accomplished when due.	The elements not accomplished when due.	The modules not accomplished in the eligibility period: PC, LC, or special.
12 to 35 months	50% of hours for initial equipment	50% of hours for initial equipment	All qualification modules of the transition curriculum.
More than 35 months	– SAME AS INITIAL EQUIPMENT TRAINING –		

**KEY:**

RGT - Recurrent Ground Training, CC - Competency Check, RFT - Recurrent Flight Training, LC - Line Check

**4.21.11.1. CREW MEMBERS WHO ARE NONCURRENT OR OVERDUE UPON REASSIGNMENT TO A DIFFERENT TYPE OF AIRCRAFT.** A crew member who is reassigned to a duty position or aircraft type in which the crew member was previously qualified, but is not currently qualified, must receive requalification training. The method used to re-qualify the crew member differs according to the reason for the requalification, as follows:

- A. A crew member that is unqualified solely because of not having accomplished the required currency events may be re-qualified in accordance with paragraphs 4.21.11.7 through 4.21.11.13 of this section, as applicable.
- B. A crew member who is unqualified for being overdue recurrent training may be re-qualified in accordance with Tables 4.21.11.1 or 4.21.11.2, as applicable.

**4.21.11.13. CREW MEMBERS REASSIGNED TO A PREVIOUSLY HELD DUTY POSITION IN AN AIRCRAFT CURRENTLY BEING FLOWN.** When a crew member is reassigned to a duty position previously held in the same type of aircraft the crew member currently flies, requalification training may be necessary. The method used to re-qualify the crew member differs according to the reason for the requalification, as follows:

- A. When a pilot is returning from SIC to PIC or from FE to SIC, the crew member must meet both the recency of experience and recurrent training requirements for the duty position or be placed in requalification training.

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- 1) A crew member that is unqualified solely for being noncurrent may be re-qualified in accordance with paragraphs 4.21.11.7 through 4.21.11.13 of this section as applicable.
  - 2) A crew member that is unqualified for being overdue for a recurrent training module may be re-qualified in accordance with Tables 4.21.11.1 or 4.21.11.2, as applicable.
- B.** When a crew member is moving from a pilot crew member position to the flight engineer position, requalification must be accomplished in accordance with paragraph 4.21.11.9 (see Table 4.21.11.1).
- C.** When a PIC moves to an SIC position, requalification training consists of seat dependent tasks related to the SIC position, such as checklist flow, and paperwork such as flight logs and mass and balance. Seat dependent requalification training requirements vary depending on the length of time the pilot was out of the SIC position and the complexity of the aircraft. Because of the wide variance in these situations it is not practical for each situation to be addressed in this handbook. POIs must exercise judgment when reviewing each case.

### **4.21.11.15. REQUALIFICATION OF FLIGHT CREW MEMBERS WHO HAVE FAILED A CHECK.**

A flight crew member who fails a required check must be entered into requalification training. The requalification training segment must consist of at least that remedial training required to restore the airman's competence in the failed events. Training may consist of as little as a detailed debriefing or it may need to be very extensive. Additional training should be given to strengthen the crew member's overall performance. The reasons for the disqualification and the training given must be entered in the airman's records.

**A.** The instructor or check pilot conducting this training must certify to the crew member's proficiency before the crew member re-accomplishes the checkride. This certification is not limited to the events the crew member failed but it encompasses all events of the qualification module.

**B.** The operator must notify the POI of all failures. Notification must be timely, so that the POI may arrange for an Inspector to conduct or observe the qualification module when, in the POI's judgment, this action is required. Observation should be accomplished in the case of PICs failing basic qualification modules or line check modules. Operators may conduct as much requalification training as necessary before scheduling and conducting the qualification module.

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**C.** The qualification curriculum segment for an SIC or FE shall consist of the module previously failed. The qualification curriculum segment for a PIC shall consist of the basic qualification module, the line check module, or both, if appropriate.

**4.21.11.17. EVALUATION OF REQUALIFICATION TRAINING CURRICULUMS FOR INITIAL APPROVAL.** When evaluating a requalification training curriculum outline for initial approval, Inspectors must determine that the appropriate aircraft ground, flight, and qualification curriculum segments are listed and that each curriculum segment contains the required elements.

**A.** Recency of experience modules only have to contain a listing of the events to be accomplished and the method the operator intends to use to accomplish them.

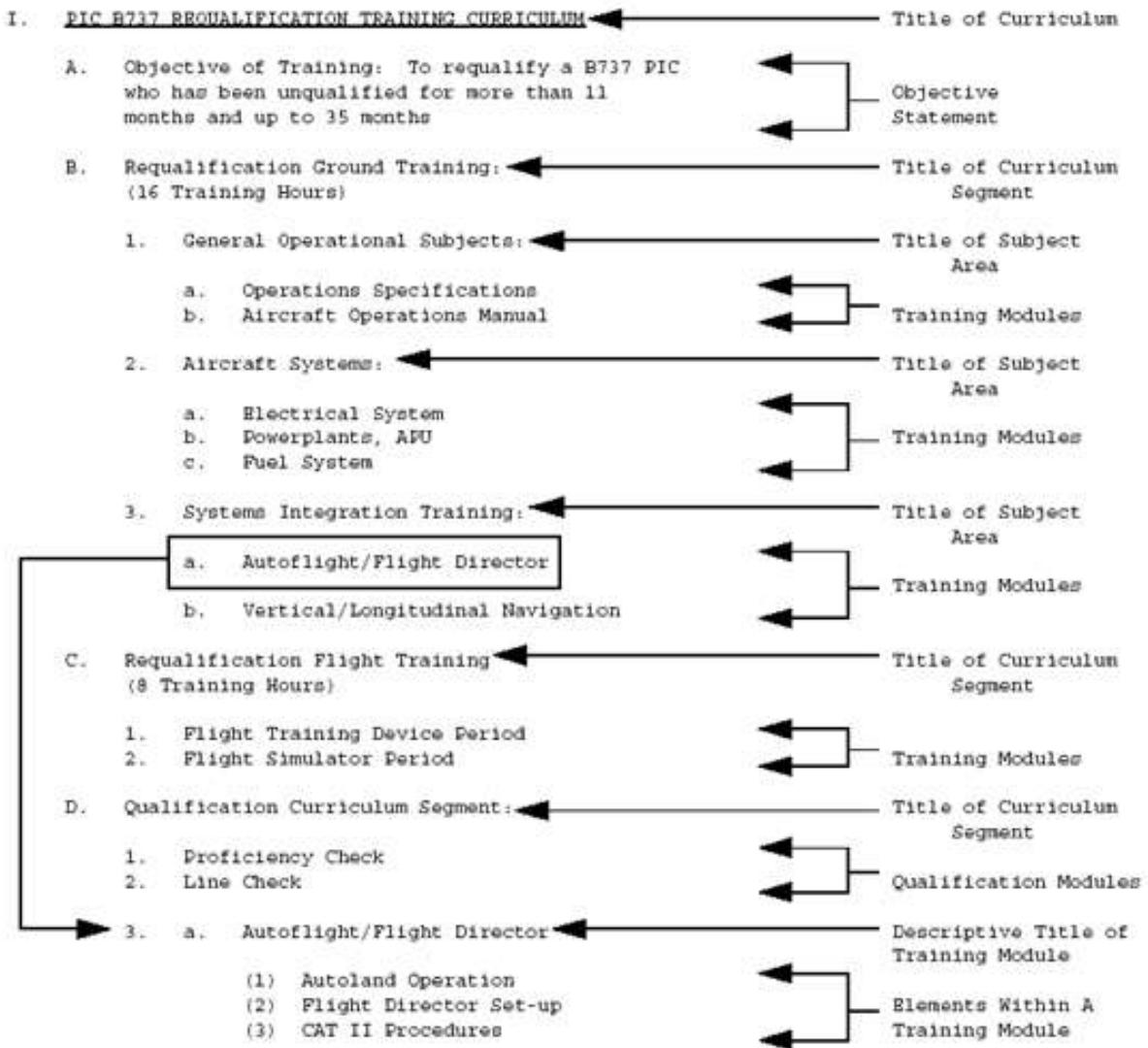
**B.** The curriculum should contain training and qualification segments for remedial training of disqualified crew members. The training segment only needs to contain a simple statement that the training given will be prescribed for the individual case in order to re establish the crew member's proficiency. The qualification segment, however, shall contain a listing of the modules the crew member must complete to regain qualification.

**C.** Separate curriculum outlines should be prepared for a crew member's overdue training in accordance with Tables 4.21.11.1 and 4.21.11.2, as appropriate. The curriculum outline should provide sufficient information to allow the POI to determine that the elements and events in each training module are adequate to properly re-qualify the crew member. An example of a requalification training curriculum outline, with a sample training module (autoflight/flight director), is in Table 4.21.11.1. The subject area content of aircraft ground and flight training curriculum segments and of qualification curriculum segments are in Sections 5, 6, and 7, respectively, of this chapter. The job aids associated with these sections should be used in conjunction with Tables 4.21.11.1 and 4.21.11.2 by POIs when determining the adequacy of an operator's proposal.

**D.** One technique an operator may use to construct requalification curriculum segments for approval is to start with ground and flight training modules from other curriculums (such as PIC transition aircraft ground training) and to remove unnecessary elements or to adjust the content of the elements as necessary. In the example shown in Figure 4.21.11.1, the number of elements and events in the training modules has been reduced from those provided for initial equipment training.

**Figure 4.21.11.1. Example of a Requalification Training Curriculum Outline**

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#### **CHAPTER 22. AIRCRAFT DISPATCHER TRAINING AND QUALIFICATION PROGRAMS**

##### **Section 1. Aircraft Dispatcher Training Curricula**

**4.22.1.1. GENERAL.** This chapter contains aircraft dispatcher training and qualification requirements and information, direction, and guidance for General Authority of Civil Aviation (GACA) personnel responsible for the evaluation and approval of aircraft dispatcher training curriculums. Except in certain specified circumstances, each air operator operating under General Authority of Civil Aviation Regulation (GACAR) Part 121 must qualify and use certified aircraft dispatchers to exercise operational control over its flights. Each air operator must also obtain GACA approval of aircraft dispatcher training curriculums. Furthermore, each air operator must ensure that its training program is complete, current, and in compliance with the regulations. Section 1 contains definitions relevant to aircraft dispatcher training, a schematic depiction of aircraft dispatcher training programs, and guidance for principal operations inspectors (POIs) concerning the training requirements and curriculum development for the five categories of training applicable to aircraft dispatchers.

**NOTE:** Unless otherwise specified in this chapter, the term “operator” applies equally to an applicant for a certificate and to an existing operator.

**NOTE:** A Part 135 operator may choose to use dispatchers, provided it includes dispatcher duties, responsibilities, and training requirements in its manual and receives approval by the President, per GACAR § 135.429. In those cases, the operator will follow the applicable guidance found in this chapter.

**4.22.1.3. DEFINITIONS.** The terms used in this chapter concerning training programs are consistent with their use in Chapter 21 of this volume, “Flight Crew Training Programs and Airman Qualifications for Part 121 and 135.” The terms are tailored specifically to aircraft dispatchers are as follows:

- *Training Program.* A system of instruction which includes curriculums, facilities, instructors, supervisors, courseware, instructional delivery methods, and testing and checking procedures. A training program must satisfy GACAR Part 121 training program requirements and ensure that

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each aircraft dispatcher remains adequately trained and current for each aircraft and operation which the operator conducts.

- *Categories of Training.* A classification of training based on who will receive the training and on the purpose of the training. There are five categories of training that apply to aircraft dispatchers:
  - o Initial new-hire
  - o Initial equipment
  - o Transition
  - o Recurrent
  - o Requalification
- *Curriculum.* A complete training agenda (found in a category of training) for one or more aircraft types; for example, a B-767 transition curriculum. Each curriculum consists of several curriculum segments.
- *Curriculum Segment.* An integral phase of training which can be separately evaluated and individually approved, but does not by itself qualify a person in the aircraft dispatcher duty position. The three curriculum segments relevant to aircraft dispatcher training are: basic indoctrination, ground training, and qualification. Each curriculum segment consists of one or more training modules.
- *Training Module.* A self-contained unit of instruction within a curriculum segment which contains descriptive information, elements, or events which relate to a specific subject. For example, an initial new-hire ground training curriculum segment must contain a training module (composed of “elements”) pertaining to meteorology. As another example, a basic indoctrination curriculum segment must include a module pertaining to appropriate provisions of the GACARs. A training module includes an outline, appropriate courseware, and instructional delivery methods.
- *Checking and Qualification Module.* Qualification curriculum segments containing the competency check and operational familiarization modules referred to as subjects in GACAR Part

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121.

- *Element.* The rudiment of the subject matter in a training, checking, or qualification module that is subject-oriented. For example, a module of a basic indoctrination curriculum segment may include such elements as aircraft nomenclature and organization of the operator's operations manual (OM).
- *Event.* The rudiment of the subject matter in a training, checking, or qualification module that is task-oriented. An event encompasses the use of a specific procedure or procedures. During a training event, a student has the opportunity for instruction, demonstration, and/or practice using specific procedures. During a checking or qualification event, the evaluator has the opportunity to determine a student's ability to correctly accomplish a specific task without instruction or supervision.
- *Courseware.* Instructional material developed for each curriculum. This is information in lesson plans, instructor guides, computer software programs, audiovisual programs, workbooks, aircraft dispatcher manuals, and handouts. Courseware must accurately reflect curriculum requirements, be effectively organized, and properly integrate with instructional delivery methods.
- *Instructional Delivery Methods.* Methodology for conveying information to a student. For example, this may include lectures, demonstrations, simulations, audiovisual presentations, programmed instruction, workshops, and drills. Training devices, aircraft, and computer work stations are also considered to be instructional delivery methods.
- *Testing and Checking.* Methods for evaluating applicants as they demonstrate a required level of knowledge in a subject, and as they apply (if appropriate) the knowledge and skills learned in instructional situations to practical situations.
- *Training Hours.* The total amount of time necessary to complete the training required by a curriculum segment. Training hours must provide opportunity for instruction, demonstration, practice, and testing, as appropriate. This time must be specified as a specific number of hours on the curriculum segment outline.
- *Programmed Hours.* The hours specified in GACAR Part 121 for initial new-hire, initial equipment, and recurrent categories of training. Programmed hours are specified in curriculum segment outlines in terms of training hours.

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- *Training/Checking Month.* The base calendar month during which an aircraft dispatcher is due to receive required recurrent training or a competency check. “Calendar” month means the first day through the last day of a particular month.
- *Eligibility Period.* Three calendar months: the calendar month before the “training/checking month,” the “training/checking month,” and the calendar month after the “training/checking month.” Training or checking completed during the eligibility period is considered to be completed during the “training/checking month.”

**NOTE:** If the training or checking occurs during the eligibility period, the “training/checking month” remains the same. A request to change the “training/checking month” to balance the training workload must be coordinated with the POI and annotated in the individual airman’s training record. This change must occur before the eligibility period.

- *Initial Approval.* The conditional authorization of an operator to begin instruction to qualify personnel under a specific curriculum or curriculum segment pending an evaluation of training effectiveness. This authorization is given in the form of an initial approval letter and must contain a specific expiration date for the conditional authorization.
- *Final Approval.* The authorization of an operator to continue training in accordance with a specific curriculum or curriculum segment (see Volume 4, Chapter 12, Section 2, Approval and Acceptance of Manuals and Checklists).

**4.22.1.5. TRAINING PROGRAMS: A SCHEMATIC DEPICTION.** Some elements of a training program are depicted in Figure 4.22.1.1 to show the relationship between the total training program and the categories of training, curriculums, curriculum segments, and training modules. Figure 4.22.1.1 is representative only, and is intended to present a framework for the modular development of a training program. By using this “modular approach,” the POI has various strategies available for the evaluation of training effectiveness and for the planning of long-term surveillance. These strategies are discussed in other sections of this chapter. Figure 4.22.1.1 is divided into five parts, as follows:

- *Part A* depicts representative components which, when combined, constitute an operator’s overall training program. These components differ in that some must be specifically approved by the GACA (for example, curriculums), while others are accepted as essential supporting parts (such as facilities and equipment).

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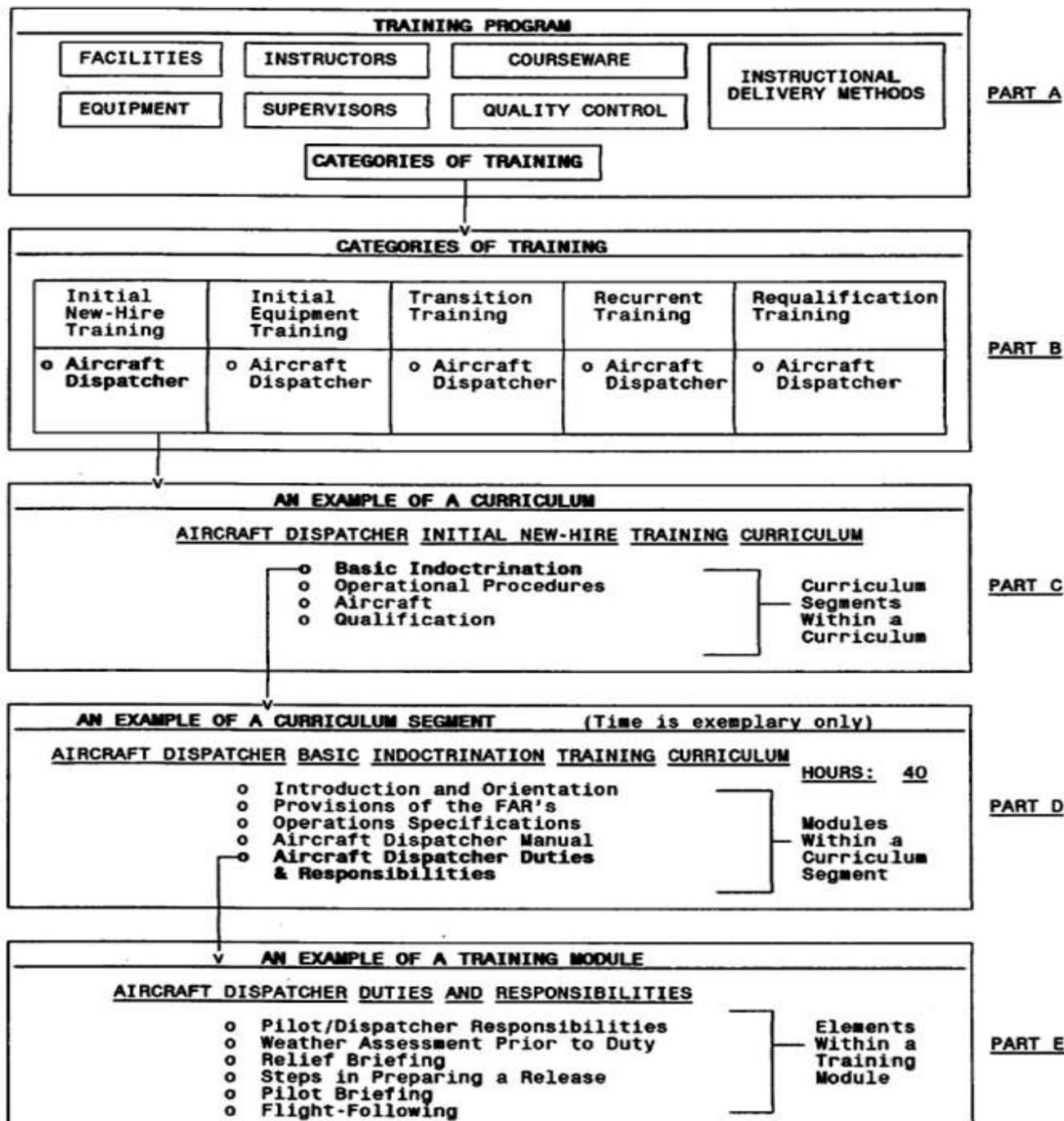
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- *Part B* illustrates the five categories of training that are recognized by the GACA for aircraft dispatchers.
- *Part C* is an example of a curriculum for the aircraft dispatcher duty position. This example depicts an aircraft dispatcher initial new-hire training curriculum.
- *Part D* is an example of a specific curriculum segment, which illustrates that it consists of several training modules. This example is the aircraft dispatcher basic indoctrination training curriculum segment.
- *Part E* is an example of a specific training module.

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Figure 4.22.1.1. Schematic Depiction of Aircraft Dispatch Training Programs



**4.22.1.7. CATEGORIES OF TRAINING.** The factors which determine the appropriate category of

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training are the student's previous experience with the operator and the student's current qualification status in relation to the specific airplane. Operators may develop and have approved several different curriculums for a specific aircraft in each category of training. While the regulatory requirements for course content may be identical for two different categories of training, the emphasis and depth of training required in each curriculum varies. When discussing training requirements, POIs should be specific regarding the category of training discussed and should use the nomenclature described in this handbook. Since use of this common nomenclature improves standardization and mutual understanding, POIs should encourage operators to use this nomenclature when developing new training curriculums or revising existing training curriculums. The five categories of training applicable to aircraft dispatchers are briefly discussed in the following subparagraphs:

**A. Initial New-Hire Training.** Operators must use the initial new-hire category of training to qualify personnel who have not had previous dispatcher experience with the operator. Initial new-hire training applies to certified dispatchers who have never worked for the operator and to personnel employed by the operator in a position other than aircraft dispatcher. This category includes initial new-hire basic indoctrination training, training in basic aircraft dispatcher duties, and training specific to one or more aircraft types. Since initial new-hire training is usually the employee's first exposure to specific company methods, policies, and procedures, it must be the most comprehensive of the five categories of training. Operators may organize initial new-hire training in a number of ways. Two common and acceptable methods follow:

- 1) Operators may limit initial new-hire training to one specific aircraft type. After the new-hire aircraft dispatcher is qualified, the operator may then conduct transition training to qualify the aircraft dispatcher in other aircraft.
- 2) Operators may design initial new-hire aircraft dispatcher training curriculums that qualify the new-hire aircraft dispatcher to dispatch all aircraft in the operator's fleet. An initial new-hire curriculum designed in this manner should contain both general and aircraft-specific training. For example, an initial new-hire aircraft dispatcher curriculum for B-767 and B-777 aircraft could contain a general module on hydraulic systems, a module on the specifics of B-767 hydraulic systems, and another module on the specifics of B-777 hydraulic systems.

**B. Initial Equipment Training.** Operators must use the initial equipment category of training to qualify an aircraft dispatcher who has previously trained and qualified as an aircraft dispatcher

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on one group of aircraft and is now qualifying on an aircraft in another group. The areas of emphasis in initial equipment training are the following:

- The general characteristics of the aircraft group
- The unique features of the specific aircraft
- The unique dispatcher duties related to the aircraft group and specific aircraft type

**C. Transition Training.** Operators must use the transition category of training for an aircraft dispatcher who has previously trained and qualified as an aircraft dispatcher on an aircraft type and is now qualifying on another aircraft type of the same group. The two areas of emphasis in transition training are the following:

- The unique features of the specific aircraft
- The specific dispatcher duties for that aircraft

**D. Recurrent Training.** Operators must use the recurrent category of training for an aircraft dispatcher who has been trained and qualified by the operator, and who must receive recurrent training and a competency check within the appropriate eligibility period to maintain currency. The area of emphasis in recurrent training is on aircraft dispatcher duties.

**E. Requalification Training.** Operators must use the requalification category of training to re-qualify an aircraft dispatcher who has been trained and qualified by the operator, but who has become unqualified due to not having satisfactorily completed recurrent training, a competency check, or operational familiarization within the appropriate eligibility period.

**F. Summary of Categories of Training.** The categories of training are summarized in general terms as follows:

- 1) All personnel qualifying as aircraft dispatchers who have not been previously employed by the operator as a dispatcher must complete initial new-hire training.
- 2) All currently qualified dispatchers who are being assigned by the operator to a different aircraft group for the first time must complete initial equipment training.

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- 3) All currently qualified dispatchers who are being assigned by the operator to any different type aircraft within the same group on which they have not been previously qualified must complete transition training.
- 4) All aircraft dispatchers must complete recurrent training within the appropriate eligibility period.
- 5) All aircraft dispatchers who have become unqualified must complete requalification training to re-establish qualification.

**4.22.1.9. CURRICULUM DEVELOPMENT.** The operator is required to develop, obtain approval for, and maintain only those curriculums that will be used. For example, operators who train new-hire dispatchers on all aircraft they operate during initial new-hire training are not required to have a transition training curriculum. Such an operator would only need a transition curriculum if a new type of aircraft were added to the fleet.

**A. Aircraft Dispatcher Qualification.** Each person that is required to train under a specific curriculum must complete that curriculum in its entirety. When a person has completed the training and checking specified in a curriculum, that person is qualified to dispatch those aircraft types specified in the curriculum in GACAR Part 121 operations.

**B. Multiple Curriculums.** Operators may develop more than one curriculum for each applicable category of training. Each curriculum may be tailored to a specific group of students. An initial new-hire curriculum developed for students with little or no previous airline experience must be more extensive than a curriculum for students with previous airline experience. For example, an abbreviated curriculum for initial new hire training may be used in merger or air carrier acquisition situations. In such cases, GACAR§ 121.851 allows for a reduction in program hours.

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#### **CHAPTER 22. AIRCRAFT DISPATCHER TRAINING AND QUALIFICATION PROGRAMS**

##### **Section 2. Aircraft Dispatcher Basic Indoctrination Curriculum Segments**

**4.22.2.1. GENERAL.** This section contains direction and guidance to be used by principal operations inspectors (POIs) when evaluating the content of aircraft dispatcher basic indoctrination curriculum segments. General Authority of Civil Aviation (GACAR) § 121.879(a)(1) requires that all new-hire aircraft dispatchers complete basic indoctrination ground training in the initial new-hire category of training.

**A. Purpose of Basic Indoctrination Training.** The basic indoctrination curriculum segment is unique to the initial new-hire category of training. An aircraft dispatcher basic indoctrination curriculum segment serves the following purposes: as an introduction for the new-hire employee to the operator, as the manner in which the operator complies with the requirements of GACAR Part 121, and as the basis for subsequent aircraft dispatcher training. The aircraft dispatcher basic indoctrination curriculum segment consists of that information required as background for new-hire aircraft dispatchers for the ground training curriculum segment.

**B. Regulatory Requirements.** GACAR § 121.879(a)(1) requires that all new-hire aircraft dispatchers complete a minimum of 40 hours of basic indoctrination training. No reduction of hours in basic indoctrination training should be permitted unless authorized by the Director, Flight Operations Division. GACAR § 121.415(a)(1) requires that training in the following subjects be included in the aircraft dispatcher basic indoctrination curriculum segment:

- Aircraft dispatcher duties and responsibilities
- Appropriate provisions of the GACAR
- Contents of the operator's operating certificate and operations specifications (OpSpecs)
- Appropriate portions of the operator's manual

**C. Optional Training Subjects.** Operators may include and take credit for training given on other subjects in the aircraft dispatcher basic indoctrination curriculum segment. These subjects

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may be in addition to the subject areas required by the GACARs and are in addition to the minimum 40 hours required by § 121.879(a)(1). This training consists of the information that new-hire aircraft dispatchers need as a foundation for the specific and detailed training to be conducted in the ground training curriculum segment. Among the appropriate subjects for this type of training are the following:

- *Overview of Company*: Type and scope of operations conducted
- *Company Structure*: Management organization; route structure; fleet composition (size and type); facility locations
- *Administrative Orientation*: Required documentation; scheduling; inner-company communications

**4.22.2.3. AIRCRAFT DISPATCHER BASIC INDOCTRINATION TRAINING.** Aircraft dispatcher basic indoctrination training curriculum segments must consist of at least the “operator-specific” training modules dealing with the requirements of GACAR §§ 121.879(a)(1) and 121.1309 and other related topics. These operator-specific training modules include the following:

**A. “Duties and Responsibilities” Module.** This module contains the duties the new-hire aircraft dispatcher will be assigned after becoming qualified. For example, a small operator may assign the aircraft dispatcher with responsibilities for constructing flight plans, load planning, and performing mass and balance calculations. GACAR § 121.1309 requires that the aircraft dispatcher ensure that such functions have been adequately accomplished before releasing a flight, whether the functions have been accomplished by the aircraft dispatcher or by another employee. The new-hire aircraft dispatcher must be trained specifically as to how and by whom these tasks are to be accomplished within the overall operation. Since the qualified dispatcher will be required to evaluate the adequacy of flight and load planning, the operator must ensure that the new-hire dispatcher has a thorough knowledge of the basic principles of these subjects.

**B. “Appropriate Provisions of the GACAR” Module.** This module contains policies and procedures that ensure that the aircraft dispatcher and the operator are in compliance with the GACARs during flight operations. Operators should cite specific regulations (appropriate provisions of the GACARs) during this module and show how the operator’s procedures are designed to comply with the GACARs as follows.

- 1) POIs must ensure that at least the following provisions of Part 121 are covered:

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- Subpart F - Airplane Performance Operating Limitations and/or Subpart G - Rotorcraft Performance Operating Limitations (as applicable)
- Subpart N - Fatigue Management Requirements
- Subpart M - Aircraft Dispatcher Qualifications
- Subpart O - Flight Operations
- Subpart P - Operational Control Systems
- Subpart Q - Records and Reports

2) POIs should also ensure that the following GACAR provisions are covered:

- GACAR Part 91
- GACAR Part 65 and Part 143 concerning dispatcher certification
- Training requirements
- Applicable portions of GACA Security Regulations
- Aviation Investigation Bureau (AIB) regulations concerning notification and reporting of aircraft accidents or incidents and overdue aircraft, and preservation of aircraft wreckage, mail, cargo, and records

### **C. “Contents of the Operator’s Operating Certificate and Operations Specifications”**

**Module.** This module contains training in the specific operations the operator may conduct, such as operations which are prohibited, required weather minimums, and limitations. The new-hire aircraft dispatcher must be thoroughly familiar with this information before assuming dispatcher duties.

**D. “Appropriate Portions of the Operator’ Manuals” Module .** This module contains training on the organization and content of the relevant sections of the operator’s manuals. Usually the training on the contents of the operator’s manuals is covered simultaneously with the training on the operator’s policies and procedures. POIs must ensure, however, that in this process the

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contents of the manuals are thoroughly covered. Operators must also provide aircraft dispatchers with information on the organization of the manuals and training on how to use the reference system of the manuals. Appropriate topics for this type of training are the following:

- Overview of manual sections, correlation of manual sections to the aircraft dispatcher training program
- Use of reference, revision, and distribution systems for manuals
- Access to manual when performing assigned duties
- Maintaining manual currency

**4.22.2.5. AIRCRAFT DISPATCHER BASIC INDOCTRINATION TRAINING MODULES.** An aircraft dispatcher basic indoctrination curriculum segment must include as many training modules as necessary to ensure adequate training. Each training module must include a module outline containing, at least, a descriptive title of the training module and a list of the related elements or events to be presented during instruction on the module.

**A. Training Module Outline.** The training module outline must contain only those elements and events required to ensure that aircraft dispatcher students will receive adequate training. Operators are not required to include detailed descriptions of each element or event for initial approval, as detailed descriptions are more appropriate for courseware. During the final approval process, the POI who evaluates the training must review the courseware to ensure that the scope and depth of the training modules are adequate.

**B. Construction of Modules.** Operators have a certain amount of flexibility in the construction of aircraft dispatcher basic indoctrination training modules.

- 1) A training module for students with significant experience in GACAR Part 121 operations may be less comprehensive than a training module for students without that experience. This is usually the case with operators who hire only highly-qualified personnel with extensive experience in GACAR Part 121 operations.
- 2) The training required by GACAR § 121.879(a) must be included in the basic indoctrination curriculum segment outline and counted toward the hours requirement for this segment. The actual sequence of the training can be determined by the operator. For

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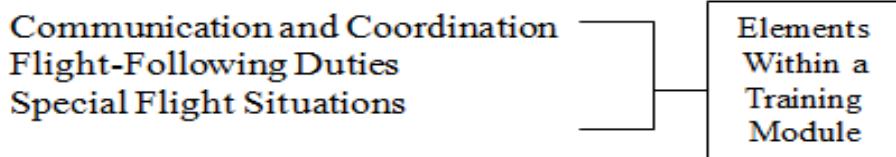
example, while the training module containing pilot in command (PIC) weather briefing requirements must be included in the aircraft dispatcher basic indoctrination curriculum segment outline, the operator may actually conduct the training for this module after having completed the meteorology training module of the initial ground training segment.

3) An operator may choose to put a training module in more than one curriculum segment. For approval purposes, however, the training module must be shown in the curriculum segment designated by the GACAR. For example, in order to comply with GACAR § 121.879, the content of the operator's OpSpecs must be covered in the basic indoctrination curriculum segment. This does not, however, prohibit the operator from covering applicable provisions of the OpSpecs in other curriculum segments, such as ground training.

**C. Training Module Outline Example.** The following is an example of one of the many acceptable methods of presenting an aircraft dispatcher basic indoctrination training module outline:

**Table 4.22.2.1. Training Module Outline - Example**

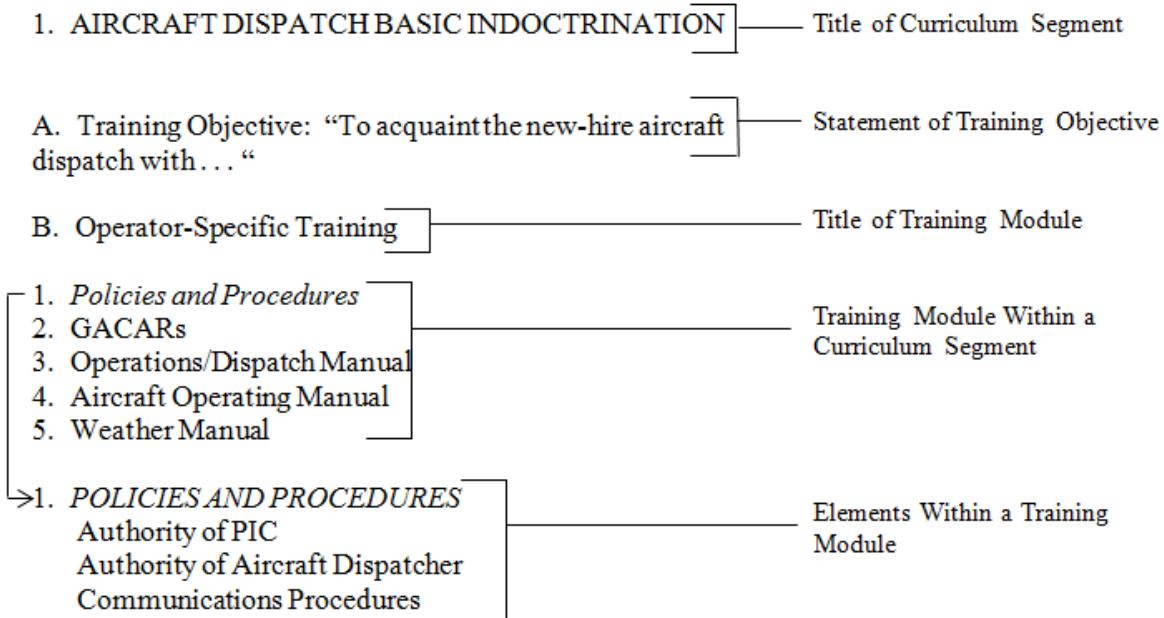
### AIRCRAFT DISPATCH DUTIES AND RESPONSIBILITIES



**D. Training Module and Curriculum Segment Interrelationship.** The following example illustrates the interrelationship between training modules in the aircraft dispatcher basic indoctrination curriculum segment:

**Table 4.22.2.2. Training Module and Curriculum Segment Interrelationship - Example**

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**4.22.2.7. CURRICULUM SEGMENT COMPLETION REQUIREMENTS.** An instructor or supervisor must certify in the training records that an aircraft dispatcher student has completed a curriculum segment. This certification is usually based on the satisfactory results of a written or oral examination. The examination may be administered at the end of each segment or at the end of the course. With some training methods, such as computer-based instruction (CBI), the certification may be based on student progress checks administered during the training course.

**4.22.2.9. EVALUATION OF TRAINING HOURS.** GACAR § 121.879 specifies a minimum of 40 programmed hours of instruction for aircraft dispatcher basic indoctrination training. Operators who employ personnel with little or no previous Part 121 experiences should program 40 training hours for basic indoctrination. POIs must consider the complexity of both the operation and the aircraft itself when evaluating aircraft dispatcher basic indoctrination curriculum segment outlines. Training hours for complex operations may exceed the 40-hour regulatory minimum.

**A. Dangerous Goods Training.** Dangerous goods training may not be included in the 40 hours required in the basic indoctrination curriculum. The dangerous goods training program is regulated by GACAR Part 121, Subpart R, GACAR Part 109 and the operator's approved program identified in its OpSpecs A55. Typically, the extent of dangerous goods training for dispatchers depends upon the operator. A dispatcher that is responsible for accepting and/or handling dangerous goods must receive more intensive training than one only required to be

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familiar with dangerous goods. If an operator chooses to include dangerous goods training in its basic indoctrination curriculum, the hours allotted to that training must be in addition to the required minimum 40 hours. The 40 hours required in the initial ground training curriculum in GACAR § 121.895 also may not include dangerous goods training (TDG).

### **4.22.2.11. CREDITING DISTANCE LEARNING AS A COMPONENT OF TRAINING FOR AIRCRAFT DISPATCHERS.**

**A. Background.** In the so-called “Information Age” many new information-sharing systems have been developed. Those systems have been centered largely on digital technology involving desktop computers and the Internet. Those systems include modern training products, many of which are being used effectively today in aviation courses conducted by accredited universities and in air operator training programs approved by the GACA. Collectively, those products fall under a relatively new heading that has been called distance learning (DL). As the quality of those products continues to improve, the training/learning process stands to benefit even more. Previous guidance has indicated that traditional classroom training was inherently superior to other training. That presumption was reflected in this order and elsewhere. Besides the proven effectiveness of modern training products, DL affords a low- cost alternative to classroom training, an alternative that is timely and appropriate in today’s challenging economic environment. The updated guidance that follows should promote wider implementation of modern training methods apart from the traditional classroom.

**B. Applicability.** This paragraph applies to aircraft dispatcher training programs subject to GACA approval under GACAR Part 121. It may also be useful to POIs who oversee dispatcher training courses under GACAR Part 143. Creditability of hours spent in DL activities applies to the programmed hours of training specified in GACAR Part 121.

**C. Distance Learning (DL) Definition.** DL is a term used in the aviation industry with various meanings depending on context. For the purposes of this section, DL means learning that is accomplished by any training method not including an instructor and a gathering of trainees collocated in a traditional classroom. DL is known by other terms such as e-learning, home study, self-guided training, virtual classroom, distributed training, computer-based training (CBT), Web-based training, and others.

**D. Interim Guidance.** Experts continue to develop a systematic approach for using the many effective training methods and products now available. It is unlikely that the last word will be

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written in the foreseeable future, if ever, since there is apparently no end to the prospects. The guidance contained in this paragraph applies until superseded, and should be used to help implement and standardize DL among air carriers.

**E. Training Objectives and Proficiency.** A training objective is a desired performance or behavior demonstrated under certain conditions with respect to specific standards. One way to identify training objectives and to verify that they have been met (also known as validation), is by utilizing a three-tier scheme comprised of knowledge, skill, and performance.

1) *Knowledge.* Specific information required which enables a student to develop the skills and attitudes to effectively recall facts, identify concepts, apply rules or principles, solve problems, and think creatively. Because knowledge is covert, students must be assigned overt activities to demonstrate their knowledge base. Knowledge may be validated through written, electronic, or oral testing. Examples include learning facts by rote, such as an operator's history, organization, and general policies, committing an Aircraft Flight Manual's (AFM) limitations to memory, or getting a basic understanding of an airplane's systems.

2) *Skill.* An ability enabled by knowledge to perform an activity or action. Skills are often grouped into cognitive skill and psychomotor skill categories.

a) *Cognitive skill.* Cognitive skill is the ability to perform a task requiring manipulation of words, numbers and symbols, which requires the application of knowledge. Usually involves classification, the application of (mental) rules, procedures or principles, the solution of problems or the application of creative thinking.

1. May be validated through written, electronic, or oral testing or through task performance.

2. Examples: Challenging a dispatch trainee to apply knowledge of an airplane's limitations to a mass and balance computation; or to apply basic systems knowledge to operating aircraft systems, and populating data in the flight planning system.

b) *Psychomotor Skill.* Ability to perform a task requiring dexterity, coordination and muscular activity. Requires the application of knowledge. Usually involves the

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manipulation of objects or materials and the use of fine and gross muscular movement in a coordinated manner.

1. May be validated through performance of a task.
  2. Example: Proper and efficient utilization of performance and flight planning tools to achieve the desired results.
- c) Performance. Ability to accomplish useful work by combining knowledge, skill, and intangibles such as inference and judgment (sometimes called “soft skills”). Practice and application develop abilities for demonstration.
1. May be validated through performance of related tasks, sometimes called event sets.
  2. Example: Demonstrating competence as a dispatcher in any operational situation or simulation involving flight planning, dispatch release, or flight following.

3) Performance. Ability to accomplish useful work by combining knowledge, skill, and intangibles such as inference and judgment (sometimes called “soft skills.”) Practice and application develop abilities for demonstration.

- a) May be validated through performance of related tasks, sometimes called event sets.
- b) Example: Demonstrating competence as a dispatcher in any operational situation or simulation involving flight planning, dispatch release, or flight following.

**F. Scope of Creditability of DL.** DL credit is appropriate for knowledge objectives and for cognitive skill objectives. Creditability of DL is more complicated in regard to psychomotor skills and performance, and is not addressed in this section.

### **G. Limits on Creditability of DL.**

- 1) The GACA recognizes the great training potential of DL that is well planned and effectively validated. Training developed in accordance with an implementation plan (described below) is subject to GACA approval. In the past, credit for DL for flight dispatch

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training was limited to recurrent and requalification training and there were limits to the number of program hours that could be initially credited. Initially, DL may now be as much as 50 percent creditable toward the knowledge and cognitive skill training objectives in all ground training, including the following training categories:

- Basic Indoctrination
- Initial and Transition Ground Training
- Recurrent
- Requalification

2) Applicants for DL must be able to show, for those categories chosen, that DL methods are at least as effective as instructor led, traditional classroom training, relative to knowledge and cognitive skill training objectives. Dispatch applications, supervised operating experience, area qualification, and practice would be excluded from DL. Dispatch resource management (DRM) is considered a dispatch application. Due to the critical nature and safety implications of these categories, they are initially excluded from DL. Consideration for some DL in these categories is possible, based on the quality of that DL.

**H. Training Media.** The general nature and specific characteristics of training media used for DL vary widely. Examples include paper media, videotape, CBT, CDs, Web-based training, and virtual classroom. The media used should meet the requirements of the respective training objective. Validation of training effectiveness is one of the most important components of the implementation plan described below.

**I. Implementation Plan.** Any proposal for ground training to be accomplished by DL should include a plan for start-up, validation, operation, and maintenance of that training. This plan should include at least the following elements:

1) *Start-up.* Identification of knowledge and cognitive skill areas, and specific training objectives.

a) Training objectives can be reduced to simple terms such as being able to:

- Recall

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- Recognize
- Comprehend
- Apply

1. Identification of the media to be used for training and testing.
  2. A validation strategy that addresses (1) the effectiveness of the training itself, and (2) the learning accomplished by each person trained. Key features of a validation strategy are shown below.
- b) Effectiveness of the ground training being conducted:
- Setting a reference. One validation method is to establish a performance baseline from which to measure the effectiveness of the training proposed. Baselines exist in most on-going air carrier training programs. Examples of performance baselines include average training hours a trainee spends in learning a certain subject, average pass-fail rates for tests of training content, median scores, average pass-fail rates for proficiency checks, and many others. A performance baseline may be set by using an existing baseline or by referring to some other existing standard
  - Maintaining currency. Validation depends upon maintaining the currency of the training to be conducted. A reliable method to do so is an essential part of a training proposal
  - Tracking. A method for keeping test results and tracking overall performance
- c) Learning accomplished by each person trained:
- A strategy for testing. Testing should be designed to determine that training objectives are being met by each trainee
  - Integrity of tests. A method should be developed to ensure integrity of tests, including integrity of test questions and test answers, and controlled access to tests and test results

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- Tracking. A method for keeping test results and tracking each individual's performance

2) *Validation.* Validation of training is a determination that the training proposed actually succeeds in meeting the performance objectives for that training. Two essential assessments comprise validation of training.

- a) Knowledge Validation. Assessment of a student's technical knowledge, accomplished by written or oral test.
- b) Cognitive Skill Validation. Assessment of an individual's practical application of knowledge, which may be accomplished by written or oral test, or by a more subjective evaluation by a flight dispatch instructor.

3) *Passing Grade—80 Percent* The dispatcher should satisfactorily accomplish the knowledge test (oral, written, or computer based), with a minimum passing score of 80 percent. Any incorrect test answers should be addressed at the time of the test, and should be corrected to 100 percent. A score less than 80 percent would require retraining in all substandard areas, retesting before entry, and continuance of training in practice, application, and demonstration.

4) *Integrity of test questions depends on several factors.*

- a) Scope. A test for an initial trainee should include at least one question for each element contained in each training module. Ground training and testing for trainees in other curriculum segments such as recurrent may be less comprehensive, but should cover significant and timely subjects, particularly new material and changes since one's previous recurrent ground training.

**NOTE:** An element is a subgroup of related content within a training module. It is the fourth level of curriculum detail—curriculum, curriculum segment, training module, element. For example: Weather is one training module; domestic weather reports, international weather reports, and the use of actual and prognostic weather charts are elements.

- b) Library. A library of questions should be developed that thoroughly cover the training objectives.

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- c) Multiple Questions. Where possible, multiple questions should be developed for each training objective.
- d) Uniqueness. Tests should be generated by random selection of questions from the library, so that no two tests are alike.
- e) Currency. Test questions should be reviewed as often as necessary to assure their relevancy, and to incorporate new or changed material

**J. Integrity of Test Answers.** Trainers should develop measures by which the identity of a person taking the test may be confirmed, and printed or electronic test answers may not be reproduced and distributed among trainees so as to beat the test.

**K. Operations and Maintenance.** This includes quality control procedures for the collection, protection, and analysis of data for tracking training effectiveness. Also includes a strategy for equipment upgrade, program adjustments driven by data, and feedback from trainers and trainees.

- 1) A description of the overall training process, its attributes, and mechanism for improvement, using validation tools would be required for approval. Acceptable attributes would include responsibility, process, controls, measurement, improvement process, and any interface.
- 2) Qualification as an aircraft dispatcher requires knowledge. Because of the critical nature of that knowledge an effective training program requires practice, application, and demonstration of that knowledge. Knowledge can be taught through DL. Initially, practice, application, and demonstration must occur in a classroom, instructor led environment, accomplished by a physical/verbal practice of skills that encourages interaction among participants for the specific area of knowledge.
- 3) DL can be incorporated in new and existing training programs.
- 4) Up to a 50 percent DL and 50 percent classroom, instructor-led training program may be initially approved, in each of the pertinent training categories (Initial New-hire Training, Transition Training, Recurrent Training, and Requalification Training) based on the merits of the proposed program. The 50 percent DL may be increased in any pertinent training category based on the sophistication and innovation of the DL.

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5) Incorporation of process in the approved training program will place the 50/50 (more or less) where it needs to be, based on performance.

**L. Interactivity.** Training developers should provide for interactivity between trainees and instructors, and between the trainees themselves.

- When in the field. In particular, a trainee should have ready access to an authorized ground instructor on weekdays during normal business hours to resolve questions encountered during DL and pertinent testing
- When at a centralized training location. Before any phase of training that incorporates practice, application, and demonstration, trainees should be convened in a proctored classroom setting with an instructor to resolve any remaining issues arising during DL. This interactivity is particularly beneficial in respect to standardization of trainees in initial new-hire and initial equipment curricula

### **4.22.2.15. EVALUATION OF AN AIRCRAFT DISPATCHER BASIC INDOCTRINATION**

**CURRICULUM SEGMENT OUTLINE FOR INITIAL APPROVAL.** POIs must determine whether the training modules in the operator's basic indoctrination curriculum segment outline contain the required information for aircraft dispatchers to fully understand the operator's manner of conducting operations, the operator's means of regulatory compliance, and the guidance materials pertinent to an aircraft dispatcher's duties and responsibilities. POIs should use the job aid (Table 4.22.2.3) in this section when evaluating an operator's proposed aircraft dispatcher basic indoctrination curriculum segment outline.

**A. Aircraft Dispatcher Basic Indoctrination Training Job Aid.** This job aid (see Table 4.22.2.3) is provided for guidance only and must not be construed as being a document that contains mandatory rules or regulatory requirements. The job aid is intended to assist POIs during the evaluation of individual basic indoctrination training curriculum segment modules.

#### **B. Use of Job Aid.**

1) When using the job aid, POIs should make a side-by-side comparison of the operator's proposal to make the following determinations:

- Whether the proposal serves to acquaint the student with the operator's procedures, policies, practices, and methods of compliance

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- Whether sufficient training module elements are listed to ensure that the appropriate depth and scope of the material will be presented
- 2) The job aid is organized with training subjects listed in the left column and evaluation criteria or remarks listed across the top. POIs may use the spaces within the matrix for items such as notes, comments, dates, or checkmarks. There are also blank columns and rows in each job aid for POIs to include additional training modules or evaluation criteria.

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**Table 4.22.2.3. Aircraft Dispatcher Basic Indoctrination Training Job Aid**

TRAINING SUBJECTS	EVALUATION CRITERIA			
	Adequacy of Elements/Events	Adequacy of Courseware	Training Aids and Facilities	Remarks
Company Orientation				
Operator Policies and Procedures				
Dispatcher, Operations Manual (OM), Weather Manuals				
Operations Specifications (OpSpecs)				
GACAR Part 5, SMS				
GACAR Part 91				
GACAR Part 121, Subpart F - Airplane Performance Limitations and Subpart G – Rotorcraft Performance Limitations				
GACAR Part 121, Subpart M Aircraft Dispatcher Qualification				
GACAR Part 121, Subpart N Fatigue Management Requirements				
GACAR Part 121, Subpart O Flight Operations				

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GACAR Part 121, Subpart P Operational Control System					
GACAR Part 121, Subpart Q Records and Reports					
KSA. AIP, ICAO Flight Planning Doc.					
Dispatch Resource Management (DRM)					

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#### **CHAPTER 22. AIRCRAFT DISPATCHER TRAINING AND QUALIFICATION PROGRAMS**

##### **Section 3. Aircraft Dispatcher Initial Equipment and Transition Ground Training Curriculum Segments**

**4.22.3.1. GENERAL.** This section contains direction and guidance to be used by principal operations inspectors (POI) when evaluating the content of aircraft dispatcher initial equipment and transition ground training curriculum segments. General Authority of Civil Aviation Regulation (GACAR) § 121.895 require that initial and transition aircraft dispatcher ground training curriculum segments include instruction in at least the following: general dispatch subjects, aircraft characteristics, operations procedures, and emergency procedures.

**A. General Dispatch Subjects.** General dispatch subject areas must include the following:

- Communications must include the characteristics of the systems to be used and the appropriate normal and emergency procedures to be used
- Meteorology, including various types of meteorological information and forecasts, interpretation of weather data (including forecasting of en-route and terminal temperatures and other weather conditions), frontal systems, wind conditions, and use of actual and prognostic weather charts for various altitudes
- The NOTAM system
- Navigation aids and publications
- Joint aircraft dispatcher/pilot responsibilities
- Characteristics of appropriate aerodromes
- Prevailing weather phenomena and the available sources of weather information
- ATC and instrument approach procedures

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- Approved dispatcher resource management (DRM) initial training
- Contents of the operations manual (OM)

**NOTE:** The aerodromes covered should include the aerodromes in the area for which the aircraft dispatcher will be responsible for, after becoming qualified. The operator's emphasis should be on aerodromes that create special problems for aircraft dispatchers in the operator's area of operations.

**B. Aircraft Characteristics.** The operator should provide both general training and aircraft-specific training when the aircraft dispatcher student is to be qualified on more than one type of aircraft. Training must be conducted on the general operating characteristics of the aircraft groups that the operator uses, such as turbojet or reciprocating aircraft. A description of each aircraft the aircraft dispatcher will be authorized to release is also required. This training must be directly related to aircraft dispatcher duties. The following areas should be emphasized in the operator's training program: aircraft operating and performance characteristics, navigation equipment, instrument approach and communications equipment, and emergency equipment. The operator must also provide training on the content and use of those portions of the flight manual applicable to aircraft dispatcher duties, such as minimum equipment lists (MEL), and abnormal and emergency procedures.

1) Aircraft training must be tailored to aircraft dispatcher duties. It is not necessary for this training to contain the same degree of detail and emphasis on aircraft systems as exists in flight crew training. POIs shall ensure that aircraft training is not conducted to the exclusion of other required training. For example, aircraft dispatchers should be taught that jet transport aircraft are equipped with constant speed drive (CSD) units; that CSDs are necessary for the proper functioning of the engine-driven generator; and that when a CSD is inoperative, the associated generator is also inoperative. Equipped with this knowledge, the aircraft dispatcher should be able to determine the correct action for an inoperative CSD by referring to the MEL. Aircraft dispatchers are not required to have detailed training on aircraft systems to comprehend this information.

2) Operators may choose to conduct initial equipment training on one type of aircraft or to include all aircraft the operator operates in an initial new-hire curriculum. When the operator chooses to limit initial new-hire aircraft training to one specific type of aircraft, the aircraft dispatcher must be qualified on additional types of aircraft by means of transition

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training.

3) GACAR § 121.883 requires that operators conduct differences training when the operator has aircraft variances within the same type of aircraft. This training should focus on the differences which affect aircraft dispatcher duties, such as operating characteristics, performance limitations, or MELs.

**C. Operations Procedures.** Operators must provide training in the specific operations the aircraft dispatcher must perform and training relative to each type of aircraft the aircraft dispatcher is authorized to release. Operators must provide aircraft dispatchers with specific training in the following procedures:

- Operations under adverse weather phenomena conditions must include clear air turbulence, wind shear, thunderstorms, icing and volcanic ash
- Mass and balance computations and load control procedures
- Aircraft performance computations, to include takeoff mass limitations based on departure runway, arrival runway, contaminated runways, en route limitations, and also engine-out limitations
- Flight-planning procedures, to include route selection, flight time, and fuel requirements analysis
- Dispatch release preparation
- Crew briefings
- Flight monitoring procedures
- Flight crew response to various emergency situations, including the assistance the aircraft dispatcher can provide in each situation
- MEL and Configuration Deviation List (CDL) procedures
- Manual performance of all required procedures in case of the loss of automated capabilities

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- Training in appropriate geographic areas
- ATC and instrument procedures, to include ground hold and central flow control procedures; and
- Radiotelephony procedures

**D. Emergency Procedures.** Operators must provide training to aircraft dispatchers in the procedures the dispatcher is to follow in case of an emergency. This training must cover actions taken to aid the flight crew and to notify the company, government, and private agencies.

**4.22.3.3. AREAS OF EMPHASIS.** Operators should emphasize specific areas for each category of training in the aircraft dispatcher ground training curriculum segment.

**A. Initial New-Hire Training.** In the initial new-hire category of training, operators must provide thorough training in each subject area. The operator must ensure that each aircraft dispatcher student has mastered each skill required to perform adequately on the job. In addition to the academic or classroom training, aircraft dispatchers are usually required to complete on-the-job training (OJT) to become proficient in the required aircraft dispatcher skills.

Although the GACAR does not require OJT, it is an effective method the operator can use to develop a new-hire aircraft dispatcher's skills in the finer points of aircraft dispatcher duties and responsibilities. Furthermore, it is one of the best training methods for qualifying aircraft dispatchers to the standard of performance required on competency checks.

**B. Initial Equipment Training.** Operators must conduct initial equipment training when a currently qualified aircraft dispatcher is qualifying to dispatch an aircraft of a different group, such as turbojet, turbopropeller, or reciprocating. The operator should emphasize two areas in this training: the operating characteristics of the new aircraft and the new considerations an aircraft dispatcher should make as a result of the new aircraft. For example, when aircraft dispatchers are first learning to dispatch turbojet aircraft, training will be required in high altitude meteorology, clear air turbulence awareness, the tropopause, and jetstreams.

**C. Transition Training.** Operators must conduct transition training to qualify an aircraft dispatcher in a new type of aircraft of the same group. The aircraft dispatcher must be fully qualified as a dispatcher on an aircraft of the same group to be eligible for training in the transition category. Since qualified dispatchers may be assumed to possess a general familiarity with the characteristics of airplanes of the same group, the ground training curriculum segment

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consists almost exclusively of aircraft specific training on the new aircraft.

### **4.22.3.5. EVALUATION OF TRAINING HOURS.**

**A. Initial New-Hire and Initial Equipment Ground Training Hours.** GACAR § 121.895(c) specifies the following minimum programmed hours of instruction required for the aircraft dispatcher initial new-hire and initial-equipment ground training curriculum segments are as follows:

- Turbopropeller-powered airplanes - 40 hours
- Turbojet-powered airplanes - 40 hours
- Rotorcraft - 40 hours

**B. Transition Training Hours.** Programmed hours for transition training are not specified in the GACAR. The number of hours required for transition training varies widely depending on the similarity of the aircraft types involved and the experience of the aircraft dispatcher. With similar aircraft types, transition training may not have to be extensive. When differences between aircraft types are great, more extensive training is required.

**C. Determining General Ground Training Hours.** POIs must consider the complexity of both the operation and the aircraft when evaluating an operator's general ground training curriculum outline. Training for a complex type of operation may require more than the 40-hour minimum regulatory requirement. The proposed program hours should initially be at least the 40 hours specified in GACAR § 121.895. Normally, the required training can only be accomplished in the minimum 40 hours specified by regulation for simple operations with one or two types of aircraft. When complex operations and several different aircraft types are involved, more hours are usually required. The actual required training hours can only be determined in the final approval process by the POI's observation and assessment of the training effectiveness. Reductions to the programmed hours are appropriate when the operator demonstrates that the training provided is sufficient.

**D. Reduction in Program Hours Request.** Should an operator request a reduction in programmed hours for the dispatcher initial new-hire and initial equipment ground training curriculum, the POI should not approve the request unless it includes a minimum of 32 programmed hours. This minimum should be maintained whether the reduction is based upon the

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operator's complexity and aircraft, or upon the provisions specified in GACAR § 121.851(d). No reduction below 32 hours should be approved prior to coordination with the Director, Flight Operations Division.

### **4.22.3.7. EVALUATION OF AN AIRCRAFT DISPATCHER GENERAL GROUND TRAINING**

**CURRICULUM SEGMENT OUTLINE FOR INITIAL APPROVAL.** POIs must determine whether an operator's proposed general ground training modules contain the information and training on skills required for aircraft dispatchers to become fully proficient in aircraft dispatcher duties and responsibilities. POIs should use the job aid in this section when evaluating the operator's proposed curriculum segment outline, see Table 4.22.3.1, Aircraft Dispatcher Ground Training Segment Job Aid.

**A. Aircraft Dispatcher Ground Training Segment Job Aid.** This job aid (Table 4.22.3.1) provided for guidance only, and must not be construed to be an outline of mandatory rules or regulatory requirements. The job aid is intended to assist POIs during the evaluation of individual aircraft dispatcher ground training curriculum segment modules for both initial and final approval.

**B. Use of Job Aid.** When using the job aid, POIs should make a side-by-side comparison of the operator's proposal. The job aid is organized with training subjects listed in the left column and evaluation criteria or remarks listed across the top. POIs may use the spaces within the matrix for notes, comments, dates, or checkmarks. There are also blank columns and rows in each job aid for POIs to indicate additional training modules or evaluation criteria.

**Table 4.22.3.1. Aircraft Dispatcher Ground Training Segment Job Aid**

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TRAINING SUBJECTS	EVALUATION CRITERIA			
	Adequacy of Element/Events	Adequacy of Courseware	Training Aids and Facilities	Remarks
GENERAL DISPATCH: Communications				
Meteorology Reports & Forecast				
Weather Interpret. Winds and Temperature				
Terminal & Frontal Weather				
International Weather				
Upper Air Reports and Prog. Charts				
Adverse Weather				
Notice to Airmen (NOTAM) System				
Navigational Publications				
Flight Planning				
Organized Track Systems and Procedures				
Joint Pilot - Dispatcher Responsibility				
Dispatch Release Preparation				
Forecasting Terminal Temperatures				

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Radiotelephony Procedures					
Geographic Area					
Manual Flight Planning					
Pilot-in-Command (PIC) Briefing					
Flight-Following					
Aerodromes, Terrain Aids, Approaches					
Prevailing Weather Phenomena					
AIRCRAFT: General Characteristics					
Description of Each Type					
Operating & Performance Characteristics					
Navigation and Communication Equipment and Capabilities					
Emergency Equipment					
Use of Flight Manual					
Differences					
PROCEDURES: Mass & Balance					

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Takeoff Performance Limits and Calculations					
En Route Performance Limits and Calculations					
Destination Limits and Calculations					
Flight Planning Tracks, Fuel, Alternates					
Master equipment list (MEL) and Configuration Deviation List (CDL)					
Air traffic control (ATC) and Flow Control					
Release Preparation					
Flight Monitoring					
Re-dispatch In Flight					
Emergency Procedures and Notification					
Special Aerodromes					

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#### **CHAPTER 22. AIRCRAFT DISPATCHER TRAINING AND QUALIFICATION PROGRAMS**

##### **Section 4. Aircraft Dispatcher Qualification Curriculum Segments and Recurrent and Requalification Curriculums**

**4.22.4.1. GENERAL.** This section contains information, direction and guidance for principal operations inspectors (POIs) to use for the evaluation of aircraft dispatcher qualification curriculum segments for all categories of training and for the content of aircraft dispatcher recurrent and requalification training curriculums.

**A. Initial Qualification.** General Authority of Civil Aviation Regulation (GACAR) § 121.895(b) requires that the aircraft dispatcher qualification curriculum segment of all initial qualification categories of training (initial new hire, initial equipment, and transition) must contain a competency check. However, only the qualification curriculum segment of the initial new-hire or initial-equipment category of training requires operating familiarization. In addition, GACAR § 121.965 requires that an aircraft dispatcher be familiar with the essential operating procedures for each segment of the operation, such as area or desk, in which the aircraft dispatcher exercises jurisdiction. One means an operator may use to comply with this rule is to conduct a competency check on a representative area of the operation in which the aircraft dispatcher is qualified.

**B. Currency.** The GACARs require that aircraft dispatchers complete both an annual competency check and an operational familiarization flight and also that they maintain a familiarity with the operating procedures for the operational segment over which they exercise jurisdiction.

- 1) GACAR § 121.835(c)(3) requires that each aircraft dispatcher complete recurrent training and a competency check every 12 calendar-months.
- 2) GACAR § 121.961 requires that each aircraft dispatcher complete recurrent operational familiarization every 12 calendar-months in one type of aircraft from each aircraft group in which the aircraft dispatcher is qualified to dispatch.

**NOTE:** A competency check or operational familiarization completed in the calendar month

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before or in the calendar month after the “training/checking” month is considered to have been completed in the training/checking month. This three-month period is termed the “eligibility period” (see Section 1 of this chapter, for further definition).

3) GACAR § 121.965 requires that each aircraft dispatcher be “familiar with all essential operating procedures for that segment of the operation over which he exercises dispatch jurisdiction.”

**C. Requalification.** When aircraft dispatchers lose qualification in accordance with GACAR Part 121, they must re-qualify prior to operating as an aircraft dispatcher. GACAR § 121.879(g)(1) requires that, in addition to initial, transition, and recurrent categories of training, each aircraft dispatcher be provided with the necessary training for maintaining proficiency on each aircraft and operation in which the dispatcher serves. It is the operator’s responsibility to develop the requalification training curriculum to restore a previously qualified dispatcher to a qualified status. The direction and guidance of this section is provided to standardize POI approval of requalification training curriculums.

**4.22.4.3. COMPETENCY CHECKS.** GACAR § 121.895(b) requires that an aircraft dispatcher demonstrate both knowledge and ability to a supervisor or ground instructor during a competency check. The definition of supervisor is any person that the operator has designated to conduct the competency check. A supervisor does not necessarily have to be a person with a management title. GACAR § 121.895(b) authorizes a ground school instructor to conduct a competency check. The instructor must be currently qualified as an aircraft dispatcher for the operator. During the competency check, the candidate only has to demonstrate knowledge and ability concerning those geographic areas for which the candidate is qualifying.

**A. Conduct of Check.** The competency check must be a comprehensive evaluation in which the supervisor observes all aspects of the dispatch function. A portion of the competency check must consist of the aircraft dispatcher candidate releasing actual flights. If the candidate is not currently qualified, a fully-qualified aircraft dispatcher must review and sign all required paperwork. The supervisor may conduct the remaining portion of the competency check in a classroom or other environment that enables the candidate to demonstrate knowledge and ability in those areas that may not occur during a routine duty period.

**NOTE:** Flight releases under the special fuel reserves of Operations Specification (OpSpec) B42 and planned inflight releases under OpSpec B44 should be observed under actual

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conditions if possible.

**B. Differences in Competency Checks for Each Category.** POIs should use the following guidance when evaluating competency checks in the following training categories:

- 1) *Initial New-Hire.* Aircraft dispatcher initial new-hire competency checks should include all of the types of airplanes the aircraft dispatcher will be qualified to dispatch. The POI may approve a competency check of representative types when, in the POI's judgment, a check including all types is impractical or unnecessary. Operators must make initial new-hire competency checks comprehensive enough to allow the aircraft dispatcher candidate to adequately demonstrate knowledge and ability in normal and abnormal situations.
- 2) *Initial Equipment and Transition.* Aircraft dispatcher initial-equipment checks and transition checks may be limited solely to the dispatch of the types of aircraft on which the aircraft dispatcher is qualifying (unless the check is to simultaneously count as a recurrent check).
- 3) *Recurrent and Requalification.* Aircraft dispatcher recurrent and requalification competency checks must encompass a representative sample of aircraft and routes for which the aircraft dispatcher maintains current qualification.
- 4) *Special Operations.* When an aircraft dispatcher is qualified in Extended Operations (ETOPS), or in operations conducted according to OpSpecs B42 or B44, an appropriately qualified supervisor or aviation safety inspector (Inspector) will observe and evaluate these functions.

**C. Required Proficiency Level.** The aircraft dispatcher candidate must be able to successfully dispatch all flights in the time the operator normally allows a fully-qualified aircraft dispatcher candidate to accomplish the same amount of work. Evaluators must determine that the candidate's proficiency is of a level that the successful outcome of the dispatch work is never in doubt.

**4.22.4.5. OPERATIONAL FAMILIARIZATION FLIGHTS.** The GACAR provides little guidance for the accomplishment of operational familiarization flights except for the establishment of a minimum hour requirement. An aircraft dispatcher must accomplish operational familiarization in one aircraft type of each group when initially qualifying in that group of airplanes and annually thereafter. GACAR § 121.957(a) specifies that the substitution of 1 hour of flight time for each additional takeoff

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and landing may reduce the 5 hours of operational familiarization to 2½ hours.

**A. Training Objectives.** POIs will ensure that operators make effective use of initial and recurrent familiarization flights to achieve valid training objectives as follows.

- 1) The flights selected should take the aircraft dispatcher candidate through the representative areas in which the candidate is to be qualified. The flights should transit a major terminal area within the region. For operational familiarization flights in succeeding years, the operator should have a plan to systematically expose an aircraft dispatcher to different routes and terminal areas in the aircraft dispatcher's area of responsibility.
- 2) POIs should ensure that aircraft dispatchers responsible for extended overwater routes are provided operational familiarization with those routes and with flight crew procedures, as well as with domestic routes. Aircraft dispatchers with responsibility for ETOPS and operations according to OpSpecs B42 and B44 should observe these operations.

**B. Reduction of Hours.** POIs will ensure that reduced operational familiarization hours do not forfeit the operator's training objectives for aircraft dispatchers.

**C. Operational Familiarization in a Simulator.** The GACAR permits aircraft dispatchers to accomplish operational familiarization in a simulator. POIs should encourage operators to take advantage of this provision (after the aircraft dispatcher is qualified) to allow dispatchers to observe Line-Oriented Flight Training (LOFT) and cockpit resource management training of flight crew members. This training relates directly to aircraft dispatcher duties. POIs will ensure, however, that approval is not given for operational familiarization repeatedly conducted in a simulator in lieu of actual line flights. POIs must not approve use of a simulator in lieu of actual flights in the initial new-hire or initial equipment categories of training. The GACAR does not allow for the reduction of hours in a simulator.

**NOTE:** When an operator introduces a new group of aircraft into service, an aircraft dispatcher may serve for 90 days from that date without having completed the required operational familiarization.

**4.22.4.7. QUALIFICATION CURRICULUM SEGMENTS OF INITIAL NEW-HIRE AND INITIAL EQUIPMENT CATEGORIES OF TRAINING.** The GACAR clearly specifies the events of an aircraft dispatcher initial training qualification curriculum segment. POIs should ensure that the operator's course outline submitted for initial approval contains at least each required module and

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the regulatory citation. Before granting final approval, POIs will ensure that supervisors are requiring adequate standards of proficiency on aircraft dispatcher competency checks and that aircraft dispatcher operational familiarization flights meet valid training objectives.

**4.22.4.9. QUALIFICATION CURRICULUM SEGMENTS IN THE TRANSITION CATEGORY OF TRAINING.** GACAR § 121.895 clearly specifies the events of a transition training qualification curriculum segment. The operator's course outline submitted for initial approval only has to contain the specified aircraft dispatcher competency check. The aircraft dispatcher transition category of training does not require operational familiarization. If the competency check is to be simultaneously counted as a recurrent check, however, it requires operational familiarization as a training module of the recurrent category of training. Before granting final approval, POIs will ensure that supervisors are requiring an adequate standard of proficiency on aircraft dispatcher competency checks.

**4.22.4.11. RECURRENT TRAINING.** GACAR §§ 121.879 and 121.919 require that operators conduct aircraft dispatcher recurrent training to ensure that each dispatcher remains adequately trained and proficient in assigned duties and responsibilities in relation to each assigned airplane and type of operation. GACAR § 121.879(g)(2) also requires aircraft dispatcher training in new equipment, facilities, procedures, and techniques.

**A. Training Requirement.** GACAR § 121.835(c)(3) requires that each aircraft dispatcher complete recurrent training every 12 calendar-months. Operators also must conduct a competency check of each aircraft dispatcher and ensure that each aircraft dispatcher completes 5 hours of operational familiarization flights every 12 calendar-months, as required by GACAR § 121.961. The preferred procedure is for the operator to align the month in which the aircraft dispatcher training, the competency check, and the operational familiarization flight are due.

**B. Programmed Hours.** GACAR § 121.919(c)(3) specifies the minimum programmed hours of instruction for recurrent training curriculum segments. The objective of aircraft dispatcher recurrent training is to ensure that aircraft dispatchers remain proficient in assigned duties and responsibilities. The aircraft dispatcher meets this objective when he or she can perform at an acceptable level of proficiency immediately before entering the next cycle of recurrent training, which may require more training hours than specified by the regulation. The minimum required hours are as follows:

- Turbopropeller-powered airplanes - 10 hours
- Turbojet-powered airplanes - 20 hours

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- Rotorcraft - 10 hours

**C. Recurrent Training Course Content.** GACAR § 121.919 requires recurrent training be given in each ground training subject required for initial qualification. GACAR § 121.879 and 121.895 outline these subjects. POIs must ensure that operators have a means of identifying and correcting deficiencies in each aircraft dispatcher's knowledge and proficiency in each of the required areas.

1) GACAR § 121.879(g)(2) requires training in new equipment, facilities, procedures, and techniques. Operators should allot a block of time in recurrent or specialized training each year for such topics. They should also address current problems and concerns. This block of recurrent training should undergo revision on an annual cycle.

2) Recurrent training on each aircraft type, including differences training, must be conducted for aircraft dispatchers every year. This training must directly and specifically relate to aircraft dispatcher duties and may not be simply a repeat of the training given to flight crew members. The amount of training given to the aircraft dispatcher must ensure the aircraft dispatcher's continued proficiency in duties relative to each airplane. Airplane training, however, cannot be given to the exclusion of the other required training.

**D. Approval.** The operator should prepare a course outline for initial approval which contains details of the proposed training hours and an outline of the broad topic areas to be covered. The POI shall evaluate the course content by using the job aids in Sections 3 and 4 of this chapter.

1) The training hours proposed for each year in the course outline should initially meet or exceed regulatory specifications, when required. Usually, the required recurrent training must be accomplished in the minimum hours specified by regulation for simple operations of one or two types of aircraft. The involvement of complex operations and several different airplane types normally requires more hours. Operators and POIs can only determine the actual training hours required by observing and assessing the effectiveness of the training provided.

2) After final approval, the operator may vary the content of the blocks of training designated for current topics.

**4.22.4.13. AREA FAMILIARIZATION.** Operators typically assign aircraft dispatchers to exercise

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authority over a particular geographic area, but may require that the aircraft dispatcher maintain familiarity over additional areas. GACAR § 121.965 requires operators to ensure that each aircraft dispatcher is familiar with all essential operating procedures in a particular segment or geographic area before assigning the dispatcher jurisdiction over revenue flights through that area.

**A. Criteria.** Operators must develop the criteria that identifies when an aircraft dispatcher is not current to work a segment and to develop the necessary procedures for familiarization. The means the operator may use to identify when a dispatcher is not current depends on many factors. These factors can include the complexity of the particular segment's operation, the experience of the dispatcher, and the dispatcher's length of time away from the position.

**B. Re-familiarization.** Depending on the situation, the method the operator uses to re-establish familiarization may be as simple as a briefing by a qualified dispatcher or as involved as a competency check by a supervisor.

**4.22.4.15. REQUALIFICATION TRAINING.** Aircraft dispatchers that fail to complete recurrent training, a competency check, or operating familiarization within the eligibility period must complete requalification training before they can perform unsupervised in revenue service. The content and length of the requalification curriculum depends on the length of time the aircraft dispatcher has been unqualified. POIs must ensure that requalification curriculum segment outlines contain specific program training hours and events for approval (see Table 4.22.4.1). Operators and POIs should understand that the basis for requalification is an aircraft dispatcher's demonstration of individual proficiency through a competency check and the accomplishment of delinquent training and checking events. An aircraft dispatcher must be given the amount of training required to reach an acceptable state of proficiency. The amount of hours for requalification training can never be less than the time required for annual recurrent training. If an aircraft dispatcher reaches a state of proficiency in fewer hours than programmed, the aircraft dispatcher does not have to complete the remaining programmed hours.

**Table 4.22.4.1. Requalification Training**

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<b>Amount of Time Past Month Due</b>	<b>Ground Training Segment</b>	<b>Qualification Segment</b>
Up to 3 calendar-months	Recurrent training (if not accomplished in eligibility period)	Any module not accomplished in eligibility: CC or OF
More than 3 and less than 6 months	8 hours remedial and (if not accomplished in eligibility period) recurrent training	CC and (if not accomplished in eligibility) OF
More than 6 and less than 12 months	8 hours remedial, recurrent training, and OJT to proficiency	CC and OF
More than 12 and less than 36 months	16 hours remedial, recurrent training, and OJT to proficiency	CC and OF
More than 36 months	Initial training	CC and OF

KEY: CC = Competency Check  
 OF = Operational Familiarization

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#### **CHAPTER 23. CABIN CREW MEMBER TRAINING AND QUALIFICATION**

##### **Section 1. Cabin Crew Member Training Curriculums**

**4.23.1.1. OVERVIEW.** This chapter discusses General Authority of Civil Aviation Regulation (GACAR) Part 121 cabin crew member (CCM) training and qualification requirements and provides direction and guidance to General Authority of Civil Aviation (GACA), principal operations inspector (POI) responsible for the evaluation and approval of cabin crew member training curriculums. The number of cabin crew members required depends on the number of seats installed or the number of cabin crew used during the emergency evacuation and ditching demonstrations required under GACAR §§ 121.213 and 121.217. An existing operator may need to revise its training program when purchasing new equipment, operating in a new environment, obtaining new authorizations, or when new GACAR requirements are specified. These new or revised training requirements must be incorporated into an operator's training program. Each GACAR Part 121 operator that uses cabin crew members must obtain GACA approval of the training curriculums used for that training. The operator is responsible for ensuring the training program is complete, current, and in compliance with regulations.

**NOTE:** Unless otherwise specified in this chapter, the term “operator” applies equally to an applicant for an operating certificate and to an existing operator.

**4.23.1.3. DEFINITIONS.** Several terms are used throughout this chapter and are consistent with their use in Volume 4, Chapter 21, Flight Crew Training Programs and Airmen Qualifications for Parts 121 and 135. These terms are defined as follows:

- *Training Program:* A system of instruction which includes curriculums, facilities, instructors, supervisors, courseware, instructional delivery methods, and testing and checking procedures. This system must satisfy the training program requirements of GACAR Part 121 and ensure that each cabin crew member remains adequately trained for each aircraft and kind of operation in which the cabin crew member serves.
- *Categories of Training:* Courses of training which provide the necessary training, testing, and checking for cabin crew members to serve unsupervised in revenue service. There are four categories of training for cabin crew members: initial new hire, transition, recurrent, and

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requalification. Each category of training consists of one or more curriculums.

- *Curriculum*: A complete training agenda for one or more aircraft types, for example a B-767 transition curriculum. Each curriculum consists of several curriculum segments.
- *Curriculum Segment*: An integral phase of a curriculum which can be separately evaluated and individually approved but does not by itself qualify a person in the cabin crew member duty position. The five curriculum segments relevant to cabin crew member training are: basic indoctrination training, general emergency training, aircraft ground training, aircraft differences training and qualification segments. Each curriculum segment consists of one or more training modules.
- *Training Module*: An integral part of a curriculum segment that contains descriptive information, elements, or events that relate to a specific subject. For example, an aircraft ground training curriculum segment must have a training module (composed of “elements”) pertaining to the location of aircraft equipment such as first aid kits and megaphones. As another example, a general emergency training curriculum segment may include a module pertaining to emergency situations such as ground evacuation and loss of cabin pressure. A training module includes an outline, appropriate courseware, and instructional delivery methods. It is usually completed in a single training session.
- *Checking and Qualification Module*: Qualification curriculum segments contain the checking and qualification modules specified by GACAR Part 121. A GACAR Part 121 operator’s qualification curriculum segment must contain a competency check module and an operating experience module. For a GACAR Part 121 operator these modules only need to be specified in the operator’s outline by the module title and the controlling regulation for the module.
- *Element*: An integral part of a training, checking, or qualification module that is not task oriented but subject oriented. For example, a module of a basic indoctrination curriculum segment may include such elements as aircraft nomenclature and organization of the cabin crew member manual.
- *Event*: An integral part of a training, checking, or qualification module which is task oriented and requires the use of a specific procedure or procedures. A training event provides a student with an opportunity for instruction, demonstration, and/or practice using specific procedures. A checking or qualification event provides the evaluator with the opportunity to evaluate a student’s ability to correctly accomplish a specific task without instruction or supervision.

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- *Courseware*: Instructional material developed for each curriculum. This is information in lesson plans, instructor guides, computer software programs, audiovisual programs, workbooks, cabin crew member manuals, and handouts. Courseware must accurately reflect curriculum requirements, be effectively organized, and properly integrate with instructional delivery methods.
- *Instructional Delivery Methods*: Methodology for conveying information to a student. For example, this may include lectures, demonstrations, simulations, audiovisual presentations, home study assignments, workshops, and drills. Training devices, aircraft, and computer work stations are also considered instructional delivery methods.
- *Testing and Checking*: Methods for evaluating students as they demonstrate a required level of knowledge in a subject, and as they apply (if appropriate) the knowledge and skills learned in instructional situations to practical situations.
- *Training Hours*: The total amount of time necessary to complete the training required by a curriculum segment. This time must allow opportunity for instruction, demonstration, practice, and testing, as appropriate. This time must be specified in hours on the curriculum segment outline.
- *Programmed Hours*: The hours specified in GACAR Part 121 for certain categories of training (initial new hire, transition, requalification, and recurrent). Programmed hours are specified in curriculum segment outlines in terms of training hours.
- *Training/Checking Month*: The calendar month during which a cabin crew member is due to receive required recurrent training or a competency check. “Calendar” month means the first day through the last day of a particular month.
- *Eligibility Period*: Three calendar months (the calendar month before the “training/checking month,” the “training/checking month,” and the calendar month after the “training/checking month”) during which a cabin crew member must receive both recurrent training and a competency check to remain qualified. Training or checking completed during the eligibility period, is considered to be completed during the “training/checking month.”
- *Initial Approval*: The conditional authorization of an operator to begin instruction to qualify personnel under a specific curriculum or curriculum segment pending an evaluation of training effectiveness. This authorization is given in the form of an initial approval letter and must specify

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an expiration date for the conditional authorization.

- *Final Approval:* The authorization of an operator to continue training in accordance with a specific curriculum or curriculum segment. Each page of the curriculum or curriculum segment is stamped to show final GACA approval. This authorization is given in the form of a final approval letter and does not have an expiration date.

**4.23.1.5. TRAINING PROGRAMS: A SCHEMATIC DEPICTION.** Some elements of a training program are depicted in Figure 4.23.1.1 to show the relationship between the total training program and the categories of training, curriculums, curriculum segments, and training modules.

A. The illustration in Figure 4.23.1.1 is representative only and is merely intended to present a framework for the modular development of a training program. By using this “modular approach,” the POI has a variety of strategies available for the evaluation of training effectiveness and for the planning of long term surveillance. These strategies are discussed in other sections of this chapter.

B. The illustration in Figure 4.23.1.1 consists of five parts as follows:

- 1) *Part A* depicts representative components which, when combined, constitute an operator’s overall training program. These components differ in that some must be specifically approved by the POI such as curriculums, while others are accepted as essential supporting elements such as facilities and equipment.
- 2) *Part B* illustrates the four categories of training that are recognized by the POI for cabin crew members.
- 3) *Part C* is an example of a curriculum outline for the cabin crew member duty position. This example depicts a PIC B-767 transition training curriculum.
- 4) *Part D* is an example of a specific curriculum segment and shows that it consists of several training modules. This example is the flight training curriculum segment of the B-767 cabin crew member transition training curriculum.
- 5) *Part E* is an example of a specific training module.

**4.23.1.7. CATEGORIES OF TRAINING.** There are four categories of training applicable to cabin

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crew members: initial new hire, transition, recurrent, and requalification. The two primary factors in the determination the appropriate category of training are the student's previous experience with the operator and the student's current qualification status in relation to the specific aircraft. Each category of training may consist of several curriculums which are specific to the aircraft. While the regulatory requirements for course content may be identical for two categories of training, the emphasis and depth of training required can vary. When discussing training requirements, Inspectors should be specific regarding both the category of training being discussed and the use of the nomenclature described in this handbook. Use of this common nomenclature improves standardization and mutual understanding; therefore POIs should encourage operators to use it when developing new training curriculums or when revising existing training curriculums. The four relevant categories of training are briefly discussed in the subparagraphs that follow.

**A. Initial New Hire Training.** This training category is for personnel who have not had previous experience with the operator (newly hired personnel). It also applies, however, to personnel employed by the operator who have not previously held a cabin crew member duty position with that operator. Initial new hire training includes basic indoctrination training, training in basic cabin crew member duties, and training on one or more specific aircraft types. Since initial new hire training is usually the employee's first exposure to specific company methods, policies, and procedures, it must be the most comprehensive of the four categories of training.

- 1) Operators may limit initial new hire training to one specific aircraft type. After the new hire cabin crew member is qualified, the operator may then conduct transition training to qualify the cabin crew member in the other aircraft in the operator's fleet.
- 2) Operators may design initial new hire cabin crew member training curriculums that encompass all aircraft in the operator's fleet. An initial new hire curriculum designed in this manner must contain both general curriculum segments and aircraft specific curriculum segments. For example an initial new hire cabin crew member curriculum for the B-767 and A-321 aircraft must contain training in basic cabin crew member duties (a module of basic indoctrination training) and training in duties specific to each aircraft (a module of B-767 and A 321 ground training respectively).

**B. Transition Training.** This category of training is for a cabin crew member who has been previously trained and qualified on a specific aircraft type and is now qualifying on another aircraft type. Transition training emphasizes the unique features of the aircraft and the specific cabin crew member duties on that aircraft.

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**C. Recurrent Training.** This category of training is for a cabin crew member who has been trained and qualified by the operator, and who must receive recurring training and a competency check within the appropriate eligibility period to maintain currency. Recurrent training emphasizes general emergency training and the specifics of each aircraft in which the cabin crew member is qualified.

**D. Requalification Training.** This category of training is for a cabin crew member who has been trained and qualified by the operator, but who has become unqualified to serve due to not having received recurrent training or a competency check within the appropriate eligibility period.

**E. Summary of Categories of Training.** The categories of training are summarized in general terms as follows:

- 1) All cabin crew members not previously employed by the operator as a cabin crew member must complete initial new hire training.
- 2) All cabin crew members must complete recurrent training for the aircraft type or types for which they are currently assigned within the appropriate eligibility period.
- 3) All cabin crew members who have become unqualified on an aircraft type with the operator must complete requalification training to re-establish qualification for that aircraft type.
- 4) All cabin crew members who are being assigned by the operator to a different aircraft type must complete either transition or requalification training, depending on whether or not they were previously qualified on the aircraft type.

**4.23.1.9. CURRICULUM DEVELOPMENT.** The operator is required to develop and maintain only those curriculums that will be used. Most often operators will need to develop curriculums in all four categories of training applicable to cabin crew members. Operators who train on all aircrafts they operate during initial new hire training do not require a transition training curriculum until a new aircraft is added to the fleet. Such an operator would then need a transition curriculum to train currently qualified cabin crew members on the new aircraft.

**A.** The operator may develop more than one curriculum for each applicable category of training. Each curriculum may be tailored for a specific group of students. An initial new hire curriculum developed for students without any airline experience must be more extensive than a curriculum

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which specifies only students with previous airline experience. For example, an abbreviated curriculum for initial new hire training may be used in merger or air carrier acquisition situations.

**B.** Each person required to train under a curriculum must complete that curriculum in its entirety. When a person has adequately completed the training and checking specified in a curriculum, that person is then qualified to serve in the specified aircraft type in revenue service.

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Figure 4.23.1.1. Schematic Depiction of Training Programs

**PART A**

TRAINING PROGRAM			
FACILITIES EQUIPMENT	INSTRUCTORS	COURSEWARE	INSTRUCTIONAL DELIVERY METHODS
CATEGORIES OF TRAINING			

**PART B**

CATEGORIES OF TRAINING			
Initial New-Hire Training	Transition Training	Recurrent Training	Requalification Training
<ul style="list-style-type: none"> <li>• Basic Indoc.</li> <li>• General Emg.</li> <li>• A/C Ground</li> <li>• Differences</li> <li>• Qualification</li> </ul>	<ul style="list-style-type: none"> <li>• A/C Ground</li> <li>• Differences</li> <li>• Qualification</li> </ul>	<ul style="list-style-type: none"> <li>• General Emg.</li> <li>• A/C Ground</li> <li>• Differences</li> <li>• Qualification</li> </ul>	<ul style="list-style-type: none"> <li>• General Emg.</li> <li>• A/C Ground</li> <li>• Differences</li> <li>• Qualification</li> </ul>

**PART C**

EXAMPLE OF A CURRICULUM	
B777 CABIN CREW MEMBER INITIAL NEW HIRE TRAINING CURRICULUM	
<ul style="list-style-type: none"> <li>• Basic Indoctrination</li> <li>• General Emergency</li> <li>• A/C Ground Training</li> <li>• Differences</li> <li>• Qualification</li> </ul>	<div style="border: 1px solid black; padding: 5px; margin-left: 20px;">                     Curriculum Segments Within a Curriculum                 </div>

**PART D**

EXAMPLE OF A CURRICULUM SEGMENT	
CABIN CREW MEMBER BASIC INDOCTRINATION TRAINING	TRAINING HOURS: 40
<ul style="list-style-type: none"> <li>• Introduction and Orientation</li> <li>• Aircraft Terminology and Nomenclature</li> <li>• Basic Flight Operations</li> <li>• Cabin Crew Member Manual &amp; Organization</li> <li>• Cabin Crew Member Duties &amp; Responsibilities</li> <li>• Special Situations</li> </ul>	<div style="border: 1px solid black; padding: 5px; margin-left: 20px;">                     Modules Within a Curriculum Segment                 </div>

**PART E**

EXAMPLE OF A TRAINING MODULE	
<ul style="list-style-type: none"> <li>• Crew Communications &amp; Coordination</li> <li>• Passenger Handling</li> <li>• Briefings &amp; Demonstrations</li> <li>• Stowage of Carry-on Baggage</li> <li>• Boarding</li> <li>• Cabin Inspection</li> <li>• Stations for Takeoff &amp; Landing</li> </ul>	<div style="border: 1px solid black; padding: 5px; margin-left: 20px;">                     Elements Within a Training Module                 </div>

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#### **CHAPTER 23. CABIN CREW MEMBER TRAINING AND QUALIFICATION**

##### **Section 2. Cabin Crew Member Training Approval Process**

**4.23.2.1. GENERAL.** Cabin crew member (CCM) training curriculum approvals follow the same five phase general process for approval or acceptance described in Volume 3, Chapter 1, Section 1, General Information and the Certification Process. Principal operations inspectors (POIs) should refer to Figure 4.23.2.1, CCM Training Job Aid, as a guideline during this approval process.

**4.23.2.3. REVISIONS TO TRAINING CURRICULUMS.** Volume 4, Chapter 21, Section 2, Training Approval Process, addresses procedures for proposed revisions to training curriculums, including any proposal to reduce the approved number of training hours. Curriculum hours and subject matter should not be reduced to the extent that a curriculum cannot meet its goals and objectives; in all cases, the curriculum should ensure that the crewmember stays adequately trained. Only basic indoctrination, initial, and recurrent training under GACAR Part 121 have specified numbers of programmed hours. For all other curriculums, only the subject matter requirements or objectives are stated in the regulations. Reduction of hours is permitted under GACAR Part 121 operations for basic indoctrination, initial ground, and recurrent training; however, the specified subjects should still be covered. When an established operator requests a reduction in the number of programmed hours, the operator must demonstrate to the POI that, for the applicable student's level of experience, the reduction will not be detrimental in achieving the requisite level of competency. Reductions in recurrent training classroom hours from the hours set forth in the regulations should be discouraged when there are several different types and models of aircraft in a fleet, except upon showing of exceptional, time saving, and effective training techniques such as separate mock ups for each aircraft type and model. If the number of programmed hours of a training curriculum is reduced, the operator will be provided with a letter giving the basis for the approval. The same conditions upon which approval for the reduction were based should continue. However, any change or addition of aircraft type to the operator's fleet of aircraft should necessitate review of the reduction of the number of programmed hours. Transition, differences, and upgrade ground training curriculums are derived from the applicable initial ground training curriculum. Therefore, upon approval of the POI, an established operator may omit particular subjects and have fewer hours than in the initial training curriculum. For this to be acceptable, the operator must show that the material is adequately addressed in another manner (such as recurrent training), that portions are not pertinent to the operation, or that the material can be sufficiently covered in less than the programmed hours approved in the initial

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training curriculum. When increases in recurrent or initial training are mandated by the POI, these increases would not be compensated for by decreases in the hours of existing training in other areas.

### **4.23.2.5. CCM TRAINING JOB AID.**

**A.** This document was prepared to assist POIs in the approval of CCM training conducted under GACAR Part 121 operations. The suggested way to use this job aid is as follows:

- 1) The POI should have this document copied.
- 2) The POI's recommendations should be added to the copy.
- 3) The POI should give this document to the appropriate representative of the operator, and ask that person to record how each item on the job aid is covered.
- 4) The POI can then determine which items are satisfactory and which items need changes.
- 5) When the POI is satisfied that a given item is acceptable, the POI should put any appropriate remarks next to that item, then that item should be initialed and given a date of approval.
- 6) If a letter of reduction is issued regarding any training program, the letter must be kept with the training program.

**B.** The POI should also ensure the proficiency of instructors, the applicability of training materials, and the quality of learning.

**Figure 4.23.2.1. CCM Training Job Aid**

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Item	Initial Approval	Final Approval
§ 121.839 Training Program: General.		
§ 121.843 Training Program: Curriculum.		
§ 121.879 Crew Member Training Requirements.		
§ 121.907 Crew Member Emergency Training (for each aircraft type, model, and configuration).		
§ 121.907 (a) Assignments.		
§ 121.907 (b) Procedures.		
§ 121.907 (c) Emergency Drills.		
§ 121.907 (d) Firefighting/PBE.		
§ 121.907 (e) Oxygen Requirements/Training.		
§ 121.891 CCM's: Initial and Transition Ground Training.		
§ 121.919 Recurrent Training.		
§ 121.789 Operating Experience.		
§ 121.839 Training Program: General.		
§ 121.839(a)(1) Handling of dangerous or magnetized material, if part of assigned duties.		
§ 121.839(a)(3) Adequate facilities and qualified instructors.		
§ 121.839(a)(4) Training material for each aircraft type, and particular variation current and adequate (including training devices).		
§ 121.839(a)(5) Provide enough flight instructors, simulator instructors, and approved check pilots to conduct required flight training and flight checks.		
§ 121.839(c) Provisions to ensure and record that training and competence checks are given during the required calendar month.		
§ 121.839(d) Each responsible person shall certify as to the proficiency and knowledge of the crew member.		
§ 121.839(d) Certification contained in crew member's records.		
§ 121.843 Training Program: Curriculum (as applicable).		
§ 121.843(a) Written training program for each type of aircraft is available and current. (This page should be copied for each type of aircraft)		

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§ 121.843(b)(1) A list of principal ground training subjects, including emergency training subjects, as provided.		
§ 121.843(b)(2) A list of all training devices mockups, system trainers, or other training aids that the operator will use.		
§ 121.843(b)(3) Detailed descriptions or pictorial displays of the approved normal, abnormal, and emergency maneuvers, procedures, and functions to be performed during each flight-training phase or flight check.		
§ 121.843(b)(4) A list of FSTDs approved under § 121.855, including approvals for particular maneuvers, procedures, or functions.		
§ 121.843(b)(5) The programmed hours of training that will be applied to each phase of training.		
§ 121.843(b)(6) A copy of each statement issued by the President under § 121.851(d) for reduction of programmed hours of training.		
§ 121.879 Crew Member Training Requirements.		
§ 121.879 (a) (1) Basic indoctrination ground training for newly hired crew members including 40 programmed hours of instruction, unless reduced under § 121.851, in at least the following:		
§ 121.879 (a) (i) Duties and responsibilities of crew members as applicable.		
§ 121.879 (a) (ii) Appropriate provisions of the GACAR.		
§ 121.879 (a) (iv) Appropriate portions of the operator's operating manual.		
§ 121.879 (a) (2) Initial and transition ground training specified in § 121.887 through 121.895, as applicable.		
§ 121.879 (a) (3) Emergency training as specified in §§ 121.907 and 121.911.		
§ 121.879 (c) Recurrent ground training as provided in § 121.919.		
§ 121.879 (d) Differences training as specified in § 121.883.		
§ 121.879 (g) (1) that each crew member remains adequately trained and currently proficient with respect to each aircraft.		
§ 121.879 (g) (2) that each crew member is adequately trained to qualify in new equipment, facilities, procedures, and techniques including modifications to aircraft.		
Number of hours:		
Number of programmed hours: (if hours are reduced, give reason in Remark area below.)		
Remarks:		
Crew Member Basic Indoctrination Training programs must include, but are not limited to, the following:		
• Admission to flight deck		
• authority of pilot-in-command (PIC)		
• Chain of command		
• Passenger seatbelt discipline		
• Exit seat requirements and procedures		
• Smoking requirements and procedures		

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• Reporting of equipment malfunctions		
• Carriage of armed passengers		
• Sterile cockpit procedures		
• Crew member communication and coordination procedures		
• Need for tray tables and seatbacks to be in full upright position for movement on the surface, takeoff, and landing		
• Travel of disabled (including stowage of canes, assistive devices, wheelchairs, et cetera)		
• Procedures with unusual passengers (such as those who are pregnant or require a stretcher)		
• Requirements and procedures for use and carriage of either infant or child restraint systems		
• Carry-on baggage requirements, including properly securing before entry door is closed for movement on the surface, takeoff, and landing		
• Carriage of cargo in passenger compartment		
• Recognition of dangerous goods		
• Storage and handling of dangerous goods, if they are carried in the cabin		
• Stowage of crew member baggage		
• Proper stowage of galley equipment for movement on the surface, takeoff, landing, and in flight (including galley and ticket carts)		
• Securing of restraint systems when not in use		
Passenger briefings and demonstrations in the following areas:		
• Pre-takeoff		
• Post-takeoff		
• Pre-landing		
• Prohibition against the use or carriage of psychoactive substances		
• Procedures for the use of electronic devices		
• Distribution of CCM's		
• The need for required and non-required CCM's to be seated during movement on the surface, takeoff, and landing		
• Number of CCM's or substitutes at stops		
• CCM procedures during refueling		
§ 121.907 (a) Each training program must provide the emergency training set forth in this section with respect to each aircraft type, model, and configuration, and each required crew member.		
§ 121.907(b)(1) Instruction in emergency assignments and procedures, including coordination among crewmembers.		
§ 121.907(b)(2) Individual instruction in the location, function, and operation of emergency equipment, including the following items: (NOTE: The instructor should ensure that each CCM knows the function of, and can locate and operate, each piece of equipment.)		

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• Ditching equipment		
• Evacuation equipment (which includes arming the door or putting the girt bar in place during normal operations)		
• CCM restraint systems		
• First aid equipment and its proper use		
• First aid oxygen		
• Oxygen for medical use by passengers (if applicable), including special training on chemically generated oxygen when used by the operator		
• Medical kit and its use		
• Portable fire extinguishers with emphasis on type of fire extinguishers appropriate to the class of fire		
• Protective breathing equipment (PBE)		
• Flashlights		
• Crash ax		
• Cockpit key		
• Emergency lights		
• Megaphones		
• Public address (PA) system		
• Interphone system		
• Emergency exits in the emergency mode with the evacuation slide or raft attached (if applicable)		
• Training emphasis on opening exits in adverse conditions (wind, gear failure, water, et cetera)		
§ 121.907(b)(3) Instruction in the handling of emergency situations including the following: rapid decompression situations:		
• Recognize decompression		
• Grab nearest oxygen mask		
• Sit down or hold on to something well secured		
• Wait for word from the flight deck before moving around		
Instruction in handling fire in flight or on the surface including the following:		
• Cabin fire prevention		
• Lavatory fire procedures		
• Light ballast fire procedures		
• Smoke control procedures		
• Fire control when volatile fuel is involved		
Instruction emphasizing use of electrical equipment and related circuit breakers found in the cabin area including the following:		
• Galley		
• Service centers		
• Galley lifts (when applicable)		

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• Lavatories		
• Movie projectors and screens		
• Instruction in the following evacuation situations		
• Forewarned (anticipated land and ditching): crew member coordination		
• Cabin preparation		
• Galley securing (including galley and other carts)		
• Baggage stowage		
• Passenger preparation		
• Instructions given to passengers		
• Directions to assume brace-for-impact positions commands given to passengers		
• Initiation of passenger evacuation		
• Passenger flow redirection		
• Passenger care following evacuation		
Unanticipated land and water:		
• CCM readiness		
• Crew member coordination		
• Condition assessment		
• Commands given to passengers		
• Passenger redirection		
• Passenger care following evacuation		
• Unwarranted evacuation (unneeded crew member and passenger initiated) crew member coordination		
• Condition assessment		
• Stopping the evacuation		
• Passenger care following evacuation		
• Situations when persons needing assistance, and their attendants might need help to leave the aircraft during emergency situations.		
• Post-accident survival training		
• Illness or injury		
Other abnormal situations involving crew members or passengers such as the following:		
• Procedures for when passengers abuse a CCM		
• Procedures for passengers under the influence of psychoactive substances		
• Procedures for other problem passengers who might jeopardize safety		
• Procedures for when a crew member is incapacitated		
• Procedures for turbulent air, including the following: crew member coordination		
• Maintaining seatbelt discipline by making periodic announcements		
• Hijacking and other unusual situations		

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§ 121.907(b)(4) A review and discussion of previous accidents and incidents		
§ 121.907(c)(1) One-time emergency drill during initial training. Each cabin crew member must perform the following:		
§ 121.907(c)(1)(i) At least one approved PBE drill in which the crew member combats an actual or simulated fire using at least one type of installed hand fire extinguisher or a training device that has been approved by the President.		
§ 121.907(c)(1)(ii) At least one approved firefighting drill in which the crew member combats an actual fire using at least one type of installed hand fire extinguisher or approved fire extinguisher appropriate for the type of fire to be fought.		
§ 121.907(c)(1)(iii) An emergency evacuation drill with each person evacuating the aircraft or approved training device using at least one type of installed emergency evacuation slide if applicable.		
§ 121.907(c)(2)(i)(A) Emergency Exits: List each kind (type) exit and slide		
§ 121.907(c)(2)(i)(B) Fire extinguisher (Actually operate each kind.)		
§ 121.907(c)(2)(i)(C) Oxygen Equipment (Actually operate each type (kind) of emergency oxygen system to include PBE. Include instruction on manual deployment of oxygen masks. List kinds of systems, which may differ between aircraft models as well as types.)		
§ 121.907(c)(2)(i)(D) Flotation devices. Don and use each kind of individual flotation device. List each kind (type) of life jacket below:		
List each kind (type) of flotation device:		
§ 121.907(c)(2)(i)(E) Ditching, as appropriate		
§ 121.907(e) Operations above 10,000 feet (3,050 m). Crew members who serve in operations above 10,000 feet must receive instruction in the following:		
• respiration		
• hypoxia		
• duration of consciousness without supplemental oxygen at an altitude		
• gas expansion		
• gas bubble formation		
• physical phenomena associated with decompression		
• incidents of decompression		
Emergency Evacuation Drills: (each kind)		
Drills should be conducted so each CCM actually operates every piece of emergency equipment and individually demonstrates the ability to perform the following procedures:		
Un- forewarned (unanticipated) evacuation:		
• crew members coordination		
• cockpit/cabin notification		

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• commands given to passengers		
• use of CCM restraint system		
• assumption of protective brace positions		
• actions that might be necessary during evacuation with emergency lights		
• conditions assessment		
• door opening		
• slide activation		
• passenger care after evacuation		
<u>Forewarned (anticipated) evacuation:</u>		
• crew coordination		
• cabin preparation		
• passenger preparation		
• Unwarranted (unnecessary) evacuation		
• Crew member coordination		
• stopping the evacuation		
• caring for passengers who may have gotten outside of the aircraft		
• Ditching, if applicable, including but not limited to the following, as appropriate:		
• cockpit preparation and procedures		
• crew coordination		
• passenger briefing		
• cabin preparation		
• donning and inflation of life preservers		
• use of life-lines		
• boarding of passengers and crew into a raft or a slide/raft		
• removal from aircraft (or training device) of each kind of life raft*		
• transfer of each kind of slide/raft pack from one door to another*		
• deployment, inflation, and detachment from the aircraft (or training device) of each kind of slide/raft pack		
§ 121.883 Differences Training: Crew members:		
121.891 (a) Initial and transition ground training for CCM's must include instruction in at least the following areas:		
• authority of the PIC		
• passenger handling		
• aircraft type, model, and series		
(Space is provided below for one aircraft type. Add more as required.		

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A general description of an aircraft that emphasizes characteristics and dominant parts on this aircraft which might have a bearing on the following: <ul style="list-style-type: none"> <li>• evacuations</li> <li>• ditching's</li> <li>• inflight emergency procedures</li> <li>• other related duties</li> <li>• use of PA system</li> <li>• means of communicating with other crewmembers means of communicating with other crewmembers in unusual situations including attempted hijacking</li> <li>• proper use of electrical galley equipment and controls for cabin heat and ventilation, including the setting of lights for takeoff and landing</li> </ul>			
§ 121.891(b) Initial and transition ground training for cabin crew members.			
§ 121.891(c) Basic Indoctrination Training must consist of 40 programmed hours. As per § 121.851, hours may be reduced. If hours are reduced, the reason should be given. <ul style="list-style-type: none"> <li>• Plus 8 hours if serving on turbopropeller powered aircraft</li> <li>• Plus 16 hours if serving on turbojet-powered aircraft</li> <li>• Plus 8 hours if serving on rotorcraft</li> </ul>			
§ 121.919 Recurrent Training (including differences training, if applicable)			
§ 121.919 (a) Recurrent training must ensure that each CCM is adequately trained and currently proficient with respect to each type of aircraft.			
§ 121.919 (b) Recurrent ground training programs for cabin crew members must include at least the following:			
§ 121.919 (b) (1) A quiz or other review to determine the state of the crew member's knowledge. Some form of written test is usually preferred.			
§ 121.919 (b) (2) Subjects required for initial and emergency training (see appropriate parts of this document)			
§ 121.919 (b) (3) A competence check that should cover each type, model, and series of aircraft, each piece of safety equipment, and each emergency procedure.			
	Total Number of Hours	Number of Classroom Hours	Number of Hours for Take-Home Exercises
§ 121.919 (c) The number of programmed hours required as follows: <ul style="list-style-type: none"> <li>• 12 hours turbojet-powered</li> <li>• 5 hours turboprop-powered and rotorcraft</li> </ul>			
<b>NOTE:</b> If the number of hours is reduced in accordance with § 121.851, give reasons in the Remarks area below.			
Remarks:			
§ 121.789 Operating Experience			

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§ 121.789 (e) CCM's must perform all CCM-assigned duties under the supervision of a supervisor.		
• Flight time must be 5 hours.		
• Flight time may be 2.5 hours if 2.5 hours have already been completed in approved cabin simulator.		

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 23. CABIN CREW MEMBER TRAINING AND QUALIFICATION**

##### **Section 3. Cabin Crew Member Basic Indoctrination Training Curriculum Segments**

**4.23.3.1. GENERAL.** General Authority of Civil Aviation Regulation (GACAR) § 121.879(a)(1) requires all new hire cabin crew members to complete the basic indoctrination curriculum segment in the initial new hire category of training. This section provides direction and guidance to aviation safety inspectors (Inspectors) for evaluating the content of cabin crew member basic indoctrination curriculum segments.

**A. Purpose of Basic Indoctrination Training.** The basic indoctrination curriculum segment is unique to the initial new hire category of training. The training in the basic indoctrination curriculum segment serves as an introduction for the new hire employee to the operator and to the operational requirements of GACAR Part 121 and also serves as the basis for subsequent cabin crew member training.

**B. Regulatory Requirements.** GACAR § 121.879(a)(1) requires all new hire cabin crew members to complete 40 hours of basic indoctrination training unless the required number of hours is reduced under GACAR § 121.851 or § 121.839(e). GACAR § 121.879(a) (1) requires that basic indoctrination curriculum segments for cabin crew members include training in the following areas:

- Duties and responsibilities
- Appropriate provisions of the GACARs
- Appropriate portions of the operator's manual

**C. Acceptable Basic Indoctrination Curriculum Segment Content.** In addition to the required training listed in subparagraph B above, operators should include other types of training in basic indoctrination curriculum segments. There is required training that a new hire cabin crew member must be given before performing duty in revenue service that does not fit the criteria for general emergency training or aircraft ground training. This training should be placed in the basic indoctrination curriculum segment and may be credited toward the 40 hour requirement for basic indoctrination training.

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**4.23.3.3. BASIC INDOCTRINATION TRAINING SUBJECT AREAS.** In the cabin crew member basic indoctrination training curriculum segment there are two distinct subject areas of training which are required in the conduct of basic indoctrination training. These two subject areas, which need to be covered in the curriculum segment modules, are “operator specific” training and “cabin crew member specific” training.

**A. Operator Specific Training.** “Operator specific” training must, according to GACAR §121.879(a)(1), include training modules in appropriate provisions of the GACARs and appropriate portions of the operator’s operations manual (OM). The policies and procedures contained in the operator’s manual are formulated to ensure that the cabin crew member and the operator are in compliance with the GACARs during flight operations. The operator normally fulfills both training requirements simultaneously by training cabin crew members in the requirements of the manual and by informing cabin crew members that these requirements are mandatory under the regulations. Operators are not normally required to cite specific regulations during this training. An example of operator specific training is instruction on how the operator’s specified procedures for the acceptance and stowage of carry-on baggage must be applied.

**B. Cabin Crew Member Specific Training.** “Cabin crew member specific” training, includes training on the duties and responsibilities of cabin crew members. Cabin crew member specific training covers all GACARs that pertain specifically to cabin crew members, such as the requirement that cabin crew members must have access to the manual aboard the aircraft (GACAR § 121.151(b)). Cabin crew member specific training modules should also include any additional information cabin crew members need to know, such as general aircraft and aviation orientation, when performing assigned duties. An example of cabin crew member specific training is instruction on the crew briefing during preflight.

**NOTE:** These two areas of training are not always mutually exclusive and in many cases may be covered in the same training module.

**NOTE:** The appropriate GACARs should be incorporated into the training modules of both subject areas.

**4.23.3.5. CABIN CREW MEMBER BASIC INDOCTRINATION TRAINING MODULES.** A cabin crew member basic indoctrination curriculum segment must include as many training modules as necessary to ensure adequate training. Each training module outline must provide at least a

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descriptive title of the training module and a list of the related elements or events to be presented during instruction on that module.

**A.** The training module outline must contain sufficient elements and events to ensure students will receive adequate training in both the “operator specific” area and the “cabin crew member specific” area. For initial approval, it is unnecessary for operators to include detailed descriptions of each element or event within a training module outline. Detailed descriptions are more appropriate when they are included in the operator’s courseware. During the approval process, the Inspector evaluating the training should review the courseware to ensure that the scope and depth of the training modules are adequate.

**B.** An operator has a certain amount of flexibility in the arrangement of the basic indoctrination training modules, as follows:

- 1) A training module for students with significant experience in GACAR Part 121 operations may be less comprehensive than a training module for students without that experience. This is usually the case with operators who hire only highly qualified personnel with experience in GACAR Part 121 operations.
- 2) The training modules required by the GACARs for basic indoctrination training must be included in the basic indoctrination curriculum segment outline and counted toward the hour requirement for this segment. The sequence of the actual training, however, can be determined by the operator. For example, while a training module addressing sterile cockpit requirements must be included in the basic indoctrination curriculum segment outline, the operator may actually conduct training on this module after conducting a module on aircraft specific training in the aircraft ground training curriculum segment.
- 3) While an operator may choose to put a training module in more than one curriculum segment, for approval purposes, that training module must be placed in the curriculum segment designated in this handbook. For example, in order to comply with GACAR § 121.907, the first aid training module must be placed in the general emergency training curriculum segment. At the operator’s discretion, however, the first aid training module could also be covered in the basic indoctrination curriculum segment, but cannot be included in the required number of programmed hours.

**C.** The following is an example of one of the many acceptable methods of presenting a basic indoctrination training module outline:

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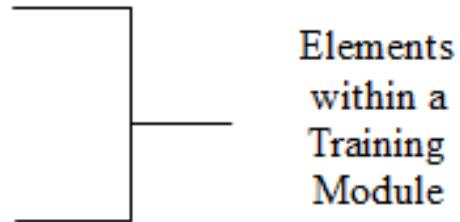
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**Figure 4.23.3.1. Crew Member Flight Duties and Responsibilities**

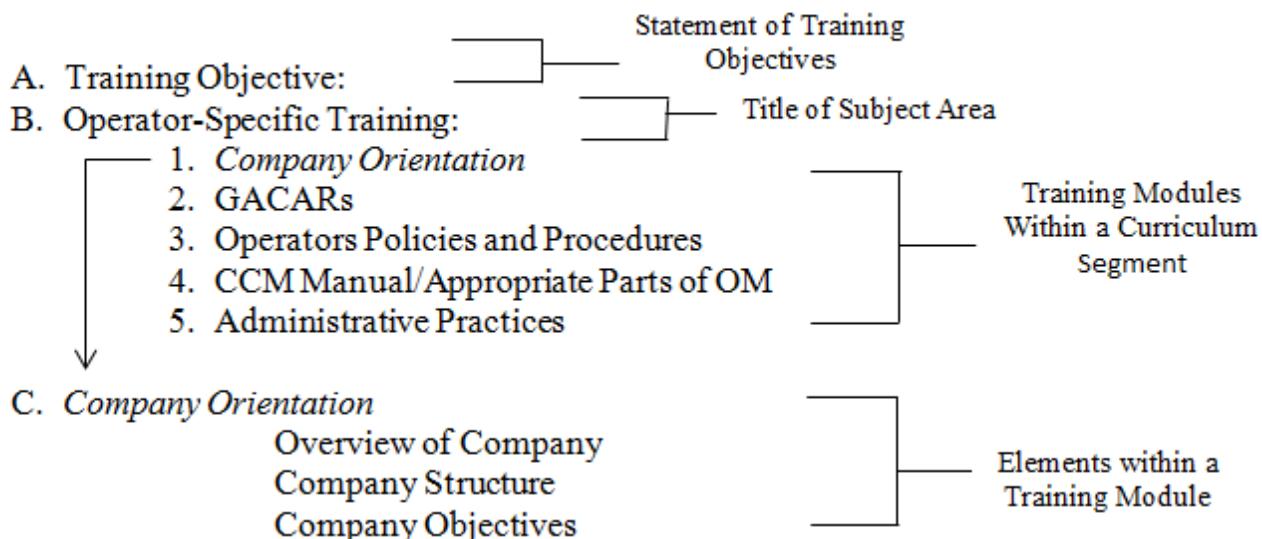
Crew Communication and Coordination  
 Routine Flight Duties  
 Special Flight situations



D. The following example illustrates the interrelationship between training modules in the cabin crew member basic indoctrination curriculum segment:

**Figure 4.23.3.2. Cabin Crew Member Basic Indoctrination Training**

I. CABIN CREW MEMBER BASIC INDOCTRINATION TRAINING.



**4.23.3.7. OPERATOR SPECIFIC TRAINING MODULES.** Operator specific training modules consist of instruction in: the operator's policies and procedures; the operator's methods of compliance with the appropriate GACARs and other applicable regulations; and information about the operator which cabin crew members, as employees, need to know to properly perform assigned duties.

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**NOTE:** Cabin crew member to know and understand not only the GACARs, but also the relationship between the GACARs and company policies.

**A. Training Criteria.** Operator specific training should be developed to ensure that cabin crew members have adequate knowledge in the following areas:

- The operator's organization, scope of operation, and administrative practices as applicable to cabin crew member assignments and duties
- Appropriate provisions of the GACARs and other applicable regulations and guidance materials
- Operator policies and procedures
- CCM manual and appropriate portions of the operator's Operating Manual

**B. Training Module Content.** The following are examples of training modules for the operator specific training subject area. These examples of training modules encompass different types of operations and may not be applicable to an operator's specific type of operation. It should be noted that there are elements and events contained in these training modules which are not specified in the GACARs but which are intended to provide Inspectors with further examples of material that may be included in training modules. These are examples only and it is not intended that these examples indicate the only acceptable sequence of instructional delivery, subject titles, or amount of detail.

### 1) Company Orientation.

- *Overview of Company:* Type and scope of operations conducted
- *Company Structure:* Management organization, route structure, fleet composition (size and type), facility locations

### 2) Appropriate Provisions of the GACARs and Other Applicable Regulations and Guidance Materials.

- *GACAR:* Regulatory function; over view of appropriate provisions of GACARs, including Parts 5, 65, 91 and 121; any pertinent additional guidance materials

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- Other regulatory agencies interfacing with civil aviation, such as, Customs, Immigration, etc., applicable recommendations of ICAO

**NOTE:** Usually operators include information of this type in the cabin crew member manual, and then train cabin crew members on the content of the manuals.

**NOTE:** Training in the “Operator Policies and Procedures” module should emphasize the relationship between the GACARs and the company’s policies and procedures.

### 3) Operator Policies and Procedures.

- Operational Policies and Regulations Relating to CCM Activities: Authority of PIC; chain of command; credential requirements for admission to cockpit; locking of cockpit door; sterile cockpit procedures; required number of cabin crew members; cabin crew member substitutes at intermediate stops; taxi requirements; passenger briefings and demonstrations; carriage and briefing of passengers who require special assistance; carry-on baggage requirements; exit row seating requirements; carriage of cargo in passenger compartments; stowage of canes and crutches; stowage of crew bags; identification and stowage of dangerous goods; fueling with passengers on board; electronic devices; carriage of pets; stowage of inflight service items; galley equipment restraints; stowage compartment restraints; cabin crew member jump seat requirements; passenger seating requirements; infant/child restraints; required placards and signs; compliance with seatbelt and no smoking signs; smoking regulations; cockpit to cabin signals; serving food to flight crew members; MEL provisions; preflight policies; reporting mechanical irregularities
- Passenger Handling Policies and Regulations Relating to CCM Activities: Passenger acceptance and refusal policies; passengers requiring special assistance; armed passengers; prisoners with escorts; couriers; unauthorized persons; apprehensive passengers; passengers who carry oxygen for personal use; oxygen administration inflight; serious illness or injury inflight; apparent death inflight; problem passengers such as passengers who appear to be emotionally disturbed, passengers who appear to be under the influence of psychoactive substances, passengers who abuse cabin crew members, passengers who interfere with a crew member in the performance of duties, passengers who smoke in lavatories, passengers who refuse to follow the safety instructions of crew members; passengers who do not

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comply with the GACARs; passengers with special needs such as infants, children, unaccompanied minors, elderly, obese, pregnant, and foreign language speaking

### 4) CCM Manual and Appropriate Portions of the Operator's Operations Manual (OM).

- CCM Manual Organization: Overview of manual sections; correlation of manual sections to cabin crew member training program; reference system; revision system; distribution system
- CCM Manual Requirements: CCM responsibilities, including carriage of manual when performing assigned duties and maintaining manual currency; importance of standardization of procedures and communication signals between flight crew members and cabin crew members
- Operations Manual: Organization and familiarity with portions applicable to cabin crew members

### 5) Administrative Practices. Required documentation; scheduling; intra-company communications.

**4.23.3.9. CABIN CREW MEMBER SPECIFIC TRAINING MODULES.** Cabin crew member specific training modules provide cabin crew members with general aircraft and aviation information and instruction on the proper performance of crew member duties and responsibilities.

**A. Training Criteria.** Cabin crew member specific training should be developed to ensure that cabin crew members have adequate knowledge in the following areas:

- Basic aircraft and aviation familiarization
- CCM requirements and standards
- Crew member flight duties and responsibilities for each phase of flight

**B. Training Module Content.** The following are examples of training modules for the cabin crew member specific training subject area. These examples of training modules encompass different types of operations and may not be applicable to an operator's specific type of operation. It should be noted that there are elements and events contained in these training modules which are

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not specified in the GACARs but which are intended to provide Inspectors with further examples of material that may be included in training modules. These are examples only and it is not intended that these examples indicate the only acceptable sequence of instructional delivery, subject titles, or amount of detail.

### 1) *General Aircraft and Aviation Orientation.*

**NOTE:** While the following elements are broad subject areas, these elements should be limited to cabin crew member and cabin safety needs in relation to the operator's specific operation.

- *Aircraft Familiarization:* Basic aircraft description and terminology (interior and exterior); basic aircraft components such as flaps and landing gear; cockpit and cabin configurations; appropriate cabin systems such as communication, lighting, and oxygen; effect of mass and balance on passenger seating; recognition of unusual aircraft functioning
- *Weather Conditions :* A basic understanding of: clear air turbulence; cloud penetration; thunderstorms; winter operations
- *Time Conversion:* 24 hour clock, including time zones; Universal Coordinated Time; International Date Line
- *Aviation Terminology:* Aerodrome; flight and ground operations; aerodrome designator

### 2) *Cabin Crew Member Requirements and Standards.*

- Company required equipment, including cabin crew member manual responsibilities; required documents and immunizations; required duties; training and qualification requirements to include recurrent training, performance checks, and competency checks;

## **C. Crew Member Flight Duties and Responsibilities**

- *Crew Communication and Coordination:* Importance and content of crew briefing; flight familiarization, including takeoffs and landings; inflight communications; postflight debriefing; crew member team concept; standardization of procedures and signals between

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cockpit and crew, to include: preflight responsibilities, chime signals, signal for evacuation, signal for sterile cockpit, security procedures, procedures for initiation of evacuation, procedures for notification of emergency, cockpit emergency assignments, procedures for notifying cockpit that all passengers are seated prior to movement of aircraft—for takeoff and for landing, positioning of cockpit door prior to takeoff, procedures for cabin crew member entry to cockpit, announcements for cabin crew members to be seated prior to takeoff

- *Routine Flight Duties:* Authority of crew duty positions; crew member duties and responsibilities specific to each crew position for each phase of flight such as emergency equipment preflight and passenger boarding responsibilities; review of GACARs and company policies relevant to cabin safety; awareness of interior and exterior safety hazards; content of passenger briefings for all phases of flight
- *Special Flight Situations:* Procedures for delayed flights; soiled food; passenger complaints; damaged personal effects

**4.23.3.11. CURRICULUM SEGMENT COMPLETION REQUIREMENTS.** An instructor or supervisor must certify that a student has completed a curriculum segment. This certification is normally based on the satisfactory results of a written or oral examination given at the end of the course. With some training methods, such as computer based instruction (CBI), the certification may be based on student progress checks administered during the course.

**4.23.3.13. EVALUATION OF TRAINING HOURS.**

**A.** GACAR § 121.879 specifies a minimum of 40 programmed hours of instruction for basic indoctrination training. Usually, 40 hours should be the minimum number of training hours for basic indoctrination for Part 121 operators who employ personnel without Part 121 experience or those with minimal Part 121 experience. When approving the basic indoctrination curriculum segment, the Inspector must consider the complexity of both the operation and the aircraft. Training for a complex type of operation may require that the 40 hour minimum be exceeded, while there may be an acceptable reduction in training hours for a less complex type of operation. Reductions to the programmed hours in certain situations may be appropriate, such as when the operator's enrollment prerequisites stipulate a high level of Part 121 experience.

**B.** Approval. When approving the basic indoctrination curriculum segment, the Inspector must consider the complexity of both the operation and the aircraft. For example, training hours for a complex type of operation may need to exceed 40 hours while the training hours for a less

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complex type of operation may be less.

### **4.23.3.15. EVALUATION OF A CABIN CREW MEMBER BASIC INDOCTRINATION**

**CURRICULUM SEGMENT OUTLINE FOR INITIAL APPROVAL.** When evaluating a basic indoctrination curriculum segment outline for initial approval, Inspectors must determine whether the training modules contain the information required for cabin crew members to fully understand the operator's manner of conducting operations, the operator's means of regulatory compliance, and the guidance materials pertinent to a cabin crew member's duties and responsibilities. Inspectors should use the job aid in this section when evaluating the proposed curriculum segment outline (see Figure 4.23.3.3).

### **4.23.3.17. CABIN CREW MEMBER BASIC INDOCTRINATION CURRICULUM SEGMENT JOB AID.**

**A.** The Basic Indoctrination Curriculum Segment Job Aid (see Figure 4.23.3.3) is provided to assist Inspectors when evaluating this curriculum segment. This job aid covers the two distinct subject areas of basic indoctrination training: operator specific training and cabin crew member specific training. The job aid is intended to assist Inspectors during the evaluation of individual basic indoctrination training curriculum segment modules.

**B.** When using the job aid, an Inspector should make a side by side comparison of the operator's proposal to make the following determinations:

- The proposal provides for both operator specific training and cabin crew member specific training
- The proposal is general in nature and serves to acquaint the student with the operator's procedures, policies, and practices
- Training modules do not contain elements which are "aircraft specific" or "emergency" training
- Sufficient training module elements are listed to ensure that the appropriate depth and scope of the material will be presented

**C.** The job aid is organized with training subjects listed in the left column and evaluation criteria listed across the top. Inspectors may use the spaces within the matrix for items such as

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notes, comments, dates, or checkmarks. There are also blank columns and rows on each job aid for Inspectors to include additional training modules or evaluation criteria.

**Figure 4.23.3.3. Basic Indoctrination Training Job Aid**

EVALUATION CRITERIA					
TRAINING SUBJECTS	Adequacy of Elements/Events	Adequacy of Courseware	Training Aids and Facilities		
Company Orientation					
GACARs					
Operator Policies and Procedures					
CCM Manual/OM Parts					
Administrative Practices					
General Aircraft & Aviation Orientation					
CCM Requirements and Standards					
Crew Member Flight Duties and Responsibilities					

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 23. CABIN CREW MEMBER TRAINING AND QUALIFICATION**

##### **Section 4. Cabin Crew Member General Emergency Training Curriculum Segment**

**4.23.4.1. GENERAL.** This section provides direction and guidance on the content, evaluation, and approval of the cabin crew member (CCM) general emergency training curriculum segments. For direction and guidance on aircraft specific emergency training, see Section 5 of this chapter.

**A.** Emergency training requirements are specified by General Authority of Civil Aviation Regulation (GACAR) § 121.907. These regulations may be divided into two types of training, which will be referred to in this section as “general” emergency training and “aircraft specific” emergency training. General emergency training is training on those emergency items that are common to all aircraft. An example of general emergency training is training on fire extinguishers and firefighting procedures which would be applicable to all aircraft in the operator’s fleet. Airplane specific emergency training is training on those items that are specific to each aircraft. An example of aircraft specific emergency training is instruction on the location of emergency equipment and crew member emergency assignments for a DC9-30 aircraft.

**B.** The objective of general emergency training is to provide CCMs with the necessary knowledge concerning emergency equipment, situations, and procedures to ensure implementation of the correct actions in the event of an emergency.

**C.** When an operator has a number of different aircraft, it is to the operator’s advantage to obtain General Authority of Civil Aviation (GACA) approval for training curriculums that have distinct general emergency training and aircraft specific emergency training segments. An operator may, however, design a training curriculum that does not make a distinction between general emergency training and aircraft specific training, such as when an operator operates only one make and model of aircraft.

1) General emergency training is required in the initial new hire, recurrent, and requalification categories of training, but not in transition training. Only aircraft specific emergency training is required in the transition category of training. An operator may choose to limit initial new hire training to a specific make and model of aircraft and then conduct transition training to qualify CCMs in each additional aircraft. When the CCM

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completes initial new hire training, a training/checking month is established and general emergency training is not required again until the next recurrent training cycle.

2) An operator may choose to train its CCMs in all makes and models of aircraft in the operator's fleet during initial new hire training. In this case, a general emergency training curriculum segment provides the basis for all aircraft specific training to follow. If a general emergency training curriculum segment is not defined, the operator must duplicate this training on each specific aircraft type.

### D. Wet Ditching Training and Drills.

1) Water impact accidents, while they rarely occur, severely test the emergency procedure skills of all flight crew members. The chances of human survival from these types of accidents have been increased by advances in cabin design and better passenger safety awareness. However, improved aircrew emergency training is the major factor contributing to human survival.

2) Aviation safety inspectors (Inspectors) should encourage their assigned operators to provide realistic environments for wet ditching training and drills. Training objectives should be accomplished in swimming pools or other safe aquatic environments using the flotation devices required to be on-board the aircraft.

3) Emergency equipment and drill training should be fully integrated into the operator's situational awareness training modules. Inspectors should ensure that inadvertent water impact accidents (ditching), such as those occurring with little or no warning, are emphasized during wet ditching training.

### 4.23.4.3. JOINT PILOT/CCM EVACUATION TRAINING.

#### A. Background.

1) During a study, the United States (US), National Transportation Safety Board (NTSB) asked flight crews who had participated in real, actual evacuations that received detailed investigations what changes could be implemented to improve emergency evacuation of passengers. Four flight crew members mentioned joint training with cabin crew members. In addition, two cabin crew members recommended joint training with the flight crew on evacuation procedures. Although many crew members had participated in joint crew

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resource management (CRM) training, a much smaller percentage indicated that it included joint evacuation drills. The NTSB recommended joint evacuation and/or wet ditching drill training and joint CRM training that included group exercises to improve crew member communication and coordination.

2) The GACA agrees with the intent of these safety recommendations and has adopted the guidance found in Federal Aviation Administration (FAA) Advisory Circular (AC) 120-51(as amended), Crew Resource Management Training, which states that cabin crew members should conduct CRM training with flight crews covering shared issues such as evacuations and ditching. In addition Inspectors must ensure that their assigned operators are aware of the performance benefits that result when flight crews and cabin crew members perform emergency evacuation and ditching drills together.

**B. Policy.** Giving crew members the opportunity to experience crew coordination and team work during required training drills is highly desirable. This is not always possible because of the difference in the numbers, the training schedules, and the training facilities of cabin crew members and flight crew members. Regardless of these challenges, airlines have used a variety of methods to ensure that crew members understand the procedures and actions of other crew members during emergency situations. These methods have included the use of videos which show the procedures for both flight crew and CCMs during a simulated emergency situation and the time frames required to complete those procedures. The simulation is especially helpful when followed by a discussion in which crew members are encouraged to discuss the role of fellow crew members.

1) The GACA recognizes the value of all activities that encourage communication and coordination between crewmembers. This would include joint CRM training, joint evacuation training, schedules that allow pilots and cabin crew members to remain together as a crew for the duration of their trip sequence, preflight briefings that occur between the captain and the cabin crew member crew, and coordination between flight crew and cabin crew member training departments to ensure standardization of procedures. As evidenced in previous guidance the principal operations inspector (POI) has accepted that these activities are strongly encouraged and air carriers routinely integrate one or more of these items into their operational procedures or training programs.

**4.23.4.5. GENERAL EMERGENCY TRAINING SUBJECT AREAS.** In the CCM general emergency training curriculum segment there are three distinct subject areas of training that are

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required in the conduct of general emergency training. These three subject areas, which need to be covered in the curriculum segment modules, are as follows: “emergency equipment” training, “emergency situation” training, and “emergency drill” training. Emergency equipment training consists of individual instruction, demonstration, and practice in the functions and operation of emergency equipment, such as fire extinguishers and oxygen bottles. Emergency situation training consists of instruction in the factors involved and the procedures to be followed when emergency situations occur, such as training on ground evacuations and inflight medical emergencies. Emergency drill training provides an opportunity for CCMs to perform emergency procedures with hands on practice in the actual operation of emergency equipment, such as a firefighting drill with the use of a fire extinguisher and protective breathing equipment (PBE).

**NOTE:** While emergency drills are always designated under the general emergency training curriculum segment, these drills can be taught as either general to all aircrafts or as aircraft specific. In addition, the training modules for general emergency training must cover the necessary training for the type of operation performed by the operator. For example, when an operator conducts extended overwater operations, the training modules must include training on the use of slide rafts or life rafts.

**A. Emergency Equipment Training.** GACAR §121.907(b)(2) requires training on certain equipment. In addition to the required equipment, training should be conducted on any additional emergency equipment located on the operator’s aircraft such as demo equipment, cardiopulmonary resuscitation (CPR) equipment, seat belt extensions, and lavatory smoke detectors. Inspectors shall ensure that training modules cover the function and operation of at least the following emergency equipment:

- Equipment used in ditching and evacuation
- First aid equipment (including its proper use)
- Portable fire extinguishers (with emphasis on type of fire extinguisher to be used for different classes of fires)
- Emergency exits in the emergency mode with the evacuation slide/raft pack attached, if applicable (with training emphasis on the operation of the exits under adverse conditions)

### **B. Emergency Situation Training.**

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1) The second subject area, emergency situation training, must, according to GACAR §§121.907(b)(1),(3), and (4); and 121.907(e), include training modules that cover emergency procedures and coordination among crew members in at least the following emergency situations:

- Rapid decompression
- Fire in flight or on the surface, and smoke control procedures (with emphasis on electrical equipment and related circuit breakers found in cabin areas including all galleys, service centers, lifts, lavatories, and movie screens)
- Ditching and other evacuations (including the evacuation of persons and their attendants, if any, who may need the assistance of another person to move expeditiously to an exit in the event of an emergency)
- Illness, injury, or other abnormal situations involving passengers or crew members (to include familiarization with the emergency medical kit)
- Hijacking and other unusual situations
- Review and discussion of previous aircraft accidents or incidents pertaining to actual emergency situations
- For crew members who serve in operations above 10,000 feet (3,050 m), instruction in respiration, hypoxia, duration of consciousness without supplemental oxygen at altitude, gas expansion, gas bubble formation, physical phenomena and incidents of decompression

2) Emergency situation training modules may also include information on any additional unusual situations that could result in an emergency situation, such as passengers who may jeopardize aircraft or passenger safety, turbulence, blown tires, and engine/auxiliary power unit (APU) torching.

### C. Emergency Drill Training.

1) The third subject area, emergency drill training, must, according to GACAR § 121.907(c) (1)(2), include training modules that ensure crew member accomplishment of these

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emergency drill requirements, as follows:

- a) The following onetime emergency drills must be performed by each crew member during initial training: the PBE/firefighting drill and the emergency evacuation drill.
  - b) The following additional emergency drills must be accomplished during initial training and once every 24 calendar months during recurrent training, with each crew member performing the following drills while operating the appropriate equipment: the emergency exit drill, hand fire extinguisher drill, emergency oxygen system drill, flotation device drill, and the ditching drill (if applicable).
  - c) The following additional emergency drills must be accomplished during initial training and once every 24 calendar months during recurrent training—with each crew member observing the following drills: life raft removal and inflation drill; slide raft transfer drill; slide or slide raft deployment, inflation, and detachment drill; emergency evacuation slide drill.
- 2) Emergency drill training modules may also include any additional drills deemed necessary by the operator, such as a CPR equipment drill or a megaphone drill.

**D. Simulate Realistic Emergency.** One element of effective emergency training is to simulate realistic emergency situations by having participants actively involved in situational problem solving activities. These types of activities provide students with the opportunity to practice emergency procedures in a controlled environment until proficiency is obtained. An example of a simulation for “emergency situation” training is one in which some CCMs prepare a “cabin” (classroom, mock up, or actual aircraft) for a land evacuation, while others assume the roles of crew members and passengers. An example of a situation for emergency drill training is one in which CCMs perform after impact commands and actions while opening an emergency exit (in the emergency mode) and directing the evacuation of passengers.

### **4.23.4.7. CABIN CREW MEMBER EVACUATION COMMAND.**

**A. Background.** During a study, the US NTSB found that for all but two operators, the command that cabin crew members’ use at floor level exits to assist in an evacuation and to ensure rapid egress from the aircraft is “Jump” or “Jump and Slide.” For one operator, the command is “Slide” and for another operator, the command is “Sit and Slide.” The NTSB felt that the process of sitting to board the slide slows the flow at the exit location such that certification test success

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would be difficult if not impossible. The operator that uses the “Sit and Slide” command also has a rapid slide procedure that includes the command “Jump and Slide.” However, the operator does not define when to use the rapid slide procedure and shows the “Sit and Slide” method on its safety information cards. The NTSB concluded that evacuations involving slide use could be delayed if passengers sit at exits before boarding a slide or if crew commands do not direct passengers how to get on a slide.

**B. Policy.** The purpose of emergency evacuation procedures is to effect a rapid egress from the aircraft of all passengers. Crew member commands and passenger information, such as that contained graphically on the safety information card, that slow down the egress from the aircraft of all passengers are not consistent with this purpose.

**C.** There may be some exits for which the command “Sit and Slide” is appropriate. For example, a B747-400 upper deck exit has a very high slide with a very steep angle to the ground. It would be appropriate to command passengers to “sit” prior to using the slide. Another example would be commands that are used for special types of passengers, such as those who may be frail, blind, or traveling with infants and small children. For the majority of floor level exits and for the majority of passengers, however, the command to “sit” at the top of the slide prior to exiting the aircraft is not consistent with the objective for the most rapid egress possible. Inspectors should review the commands used by their assigned operators for slide evacuations to ensure that they are consistent with the intent to have passengers get out of the aircraft as quickly and safely as possible. Specifically, operators should not use the command to “sit” prior to using all evacuation slides to exit the aircraft during an emergency evacuation, and passenger information cards should not show that passengers must sit at the top of all evacuation slides prior to egress from the aircraft.

### **4.23.4.9. CONTENT OF CCM GENERAL EMERGENCY TRAINING CURRICULUM**

**SEGMENT OUTLINE.** A general emergency training curriculum segment outline must include appropriate modules of emergency equipment training, emergency situation training, and emergency drill training. The modules, elements, and events listed on the outline only have to contain enough detail to ensure that the training required by the regulations is provided.

**A.** GACAR §121.907(b) specifies that crew members must receive instruction in the function and operation of emergency “equipment” and the handling of emergency “situations.” Emergency equipment training and emergency situation training are distinguished for the use of the building block approach to reinforce basic concepts. For example, emergency equipment training

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for the Halon fire extinguisher should provide training on the extinguisher's function and operation. Emergency situation training, however, should provide training on appropriate actions and commands to use when operating the Halon fire extinguisher in a particular firefighting situation.

**B.** GACAR § 121.907(c) specifies the emergency "drills" that crew members must perform and the equipment that must be operated during emergency training.

**4.23.4.11. GENERAL EMERGENCY TRAINING MODULES.** A general emergency training curriculum segment must include as many training modules as necessary to ensure adequate training. Each training module outline must provide at least a descriptive title of the training module and a list of the related elements or events that are to be presented during instruction on the module.

**A.** The general emergency training module outline must contain sufficient elements or events to ensure that students will receive adequate training in the emergency equipment, emergency situation, and emergency drill subject areas. Operators do not have to include detailed descriptions of each element or event within a training module outline. Detailed descriptions are more appropriate when included in the operator's courseware. During the approval process, Inspectors should review courseware as necessary to ensure that the scope and depth of the training modules are adequate.

**B.** The training modules designated to fulfill the requirements of GACAR § 121.907 are contained in both the general emergency training curriculum segment and the aircraft ground training curriculum segment. Operators have flexibility in the arrangement of general emergency training modules as follows:

1) The training modules required by GACAR for general emergency training must be included in the general emergency training curriculum segment outline and counted toward the hour requirement for this curriculum segment. The sequence of the actual training can be determined by the operator. For example, while a module on decompression must be contained in the general training curriculum segment outline, the operator may actually conduct training on decompression procedures immediately before or after conducting training on a related aircraft specific training module designated in the aircraft ground training curriculum segment.

2) An operator may choose to put a training module in more than one curriculum segment. For approval purposes, however, that training module must be placed in the curriculum

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segment designated in this handbook. For example, GACAR § 121.907 requires that a first aid training module be placed in the general emergency training curriculum segment. At the operator's discretion, however, the first aid training module could also be covered in the basic indoctrination curriculum segment.

**C.** Figure 4.23.4.1 is an example of one of the many acceptable methods of presenting a general emergency training module outline:

**D.** Figure 4.23.4.2 illustrates the interrelationship between training modules in the CCM general emergency training curriculum segment:

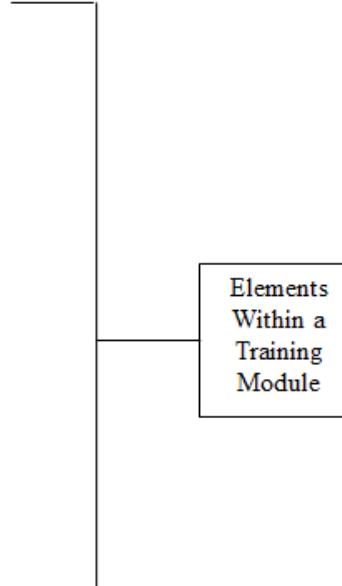
**NOTE:** In the preceding example, the number and location of each type of fire extinguisher and its location on each aircraft are not included. These elements are included in the aircraft specific emergency training module found in the CCM aircraft ground training curriculum segment (see Section 5 of this chapter).

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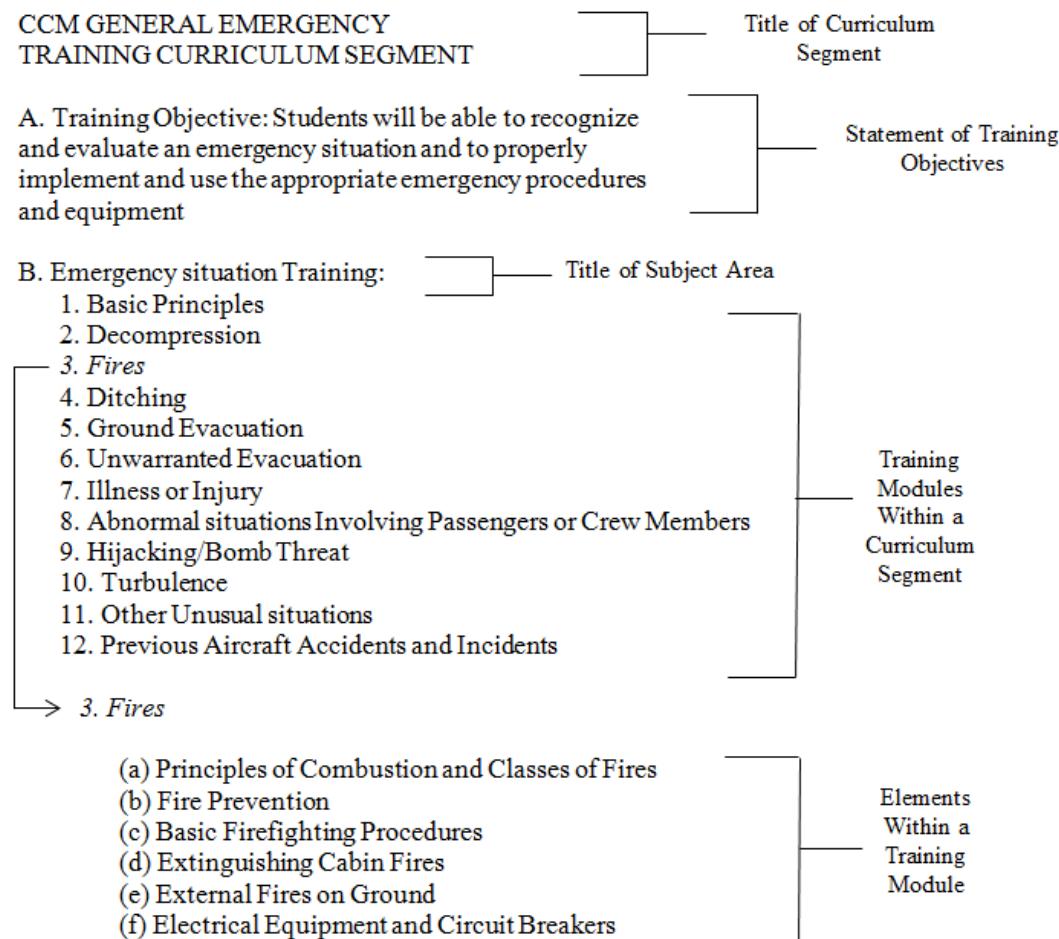
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**Figure 4.23.4.1. Training Module Elements**

- (a) *Preflight:* Inspection tags, dates, seals, proper charge levels, security of mounting, accessibility
  - (b) *Individual Extinguishers:* Removal, function, operation and operating techniques, cautions
  - (c) *Classes of Fires:* Appropriate extinguishers, specific firefighting techniques
  - (d) *Protective Breathing Equipment, Smoke Goggles:* Donning, use
  - (e) *Lavatory Equipment:* Integrity of trash container, spring-loaded doors, smoke alarms, fire extinguishers, placards
- 
- Elements Within a Training Module

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**Figure 4.23.4.2. Training Curriculum Segment**



**4.23.4.13. EMERGENCY EQUIPMENT TRAINING MODULES.** Emergency equipment training modules consist of instruction in the function and operation of that emergency equipment common to all aircraft that the student is qualifying for in the operator's fleet. Emergency equipment training must provide for the demonstration of emergency equipment that duplicates the specifications of the emergency equipment on the actual aircraft. For example, if the operator's fleet of aircraft is equipped with both portable oxygen bottles and chemical oxygen generators, then both types of oxygen devices must be used during the course of instruction. Any pertinent information related to the function of a piece of emergency equipment should also be addressed during the emergency equipment training. For example, the different types of fires must be addressed before adequate training can be given on the selection of appropriate fire extinguishers. Specifically, a training element for water fire extinguishers must emphasize that water extinguishers can only be used on Class A fires (ordinary

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combustibles).

**NOTE:** Instruction on the operation and location of pieces of emergency equipment specific to each aircraft type is addressed in the aircraft specific emergency training module found in the CCM aircraft ground training curriculum segment (see Section 5 of this chapter).

**A. Training Criteria.** Emergency equipment training should be developed to ensure that CCMs meet the following knowledge and ability criteria:

- Use of proper preflight techniques (when part of CCM duties)
- Procedures to be used if equipment fails to meet preflight requirements
- Methods to be used for removing equipment from securing devices
- Methods to be used for properly securing equipment
- Operation of equipment, including awareness of operational limitations
- Functions of equipment, including operation under adverse conditions

**NOTE:** Passengers, at times, have consciously or inadvertently moved door operating mechanisms, even when the mechanisms are located under protective plastic covers. Inspectors should ensure that their assigned operators inform crew members of the potential problem of and the need to be alert to the possibility of passengers moving an exit mechanism, and have procedures for crew members on unpressurized aircraft to check the position of the door handles periodically during flight.

**B. Training Module Content.** The following are examples of training modules for the emergency equipment subject area. These examples of training modules encompass different types of operations and may not be applicable to an operator's specific type of operation. It should be noted that there are elements and events contained in these training modules that are not specified in the regulations, but that are intended to provide POIs with further examples of material that may be included in training modules. These are examples only, and are not intended to indicate the only acceptable methods, sequence of instructional delivery, subject titles, or amount of detail.

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### 1) *Ditching Equipment.*

- *Preflight:* Inspection tags; dates; pressures; accessibility; integrity of casings
- *Life Preservers:* Removal; function; donning; inflation; activation and deactivation of locator light; donning an adult vest on a small child or infant; special use for children, non-swimmers, handicapped, elderly; swimming techniques
- *Flotation Seat Cushions:* Removal; function; donning; swimming techniques
- *Life Rafts:* Removal and handling; positioning; lanyard attachment; launching, including under adverse conditions; inflation; detachment from aircraft; boarding techniques
- *Slide Rafts:* Deployment; inflation; detachment from aircraft; move from door to door; boarding techniques
- *Slides:* Deployment; inflation; detachment from aircraft for use as a flotation device; boarding techniques
- *Raft Survival Equipment (Including Canopy and Survival Kit):* Function; use
- *Megaphones, Flashlights, Emergency Lights, Emergency Locator Transmitters, First Aid Kits:* Removal; function; use; operation during a ditching

### 2) *Ground Evacuation Equipment.*

- *Preflight:* Inspection tags; seals; dates; operable/pressures; security; accessibility
- *Window Exit Escape Ropes:* Removal; function; use during ditching or ground evacuation
- *Slides or Slide Rafts:* Deployment; inflation; sliding techniques; use under adverse conditions
- *Megaphones, Flashlights, Emergency Lights, Emergency Locator*
- *Transmitters:* Removal; function; use; operation during ground evacuation

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**NOTE:** GACAR § 121.513(t) requires two megaphones to be located in the passenger cabin on each aircraft having a seating capacity of more than 99 passengers. One megaphone is to be located at the forward end of the passenger cabin and the other at the most rearward location where it would be readily accessible from a normal CCM seat. While there is no requirement for a megaphone to be located in the upper deck passenger compartment of a passenger carrying B747 for use in an emergency situation, the GACA believes it would be prudent for operators to install one. Inspectors should encourage those operators to install a megaphone in a location on the upper deck that would be readily accessible for a CCM to use during an emergency evacuation.

### 3) *First Aid Equipment.*

- *Preflight:* Inspection tags; dates; integrity of casing; accessibility
- *Emergency Medical Kit:* Removal; contents; use, including reporting requirements
- *First Aid Kit:* Removal; contents; use

### 4) *Portable Oxygen Systems (Oxygen Bottles, Chemical Oxygen Generators, PBE).*

- *Preflight:* Inspection tags; dates; seals; pressures; integrity of tubing and masks, casings, or smoke hoods; security; accessibility
- *Portable Oxygen Devices/Masks (Oxygen Bottles and Chemical Oxygen Generators):* Removal and handling; function; operation including donning, activation, and cautions; procedure for administering oxygen to self, to passengers, and to persons with special oxygen needs; methods of securing an oxygen device while administering oxygen
- *PBE:* Removal; function; limitations; operation, including donning, activation, and cautions; use with fire extinguisher in a fire fighting situation, including methods of maneuvering in limited space with reduced visibility; use of communications system
- *Passenger Supplied Oxygen:* Function; operation; requirements for carriage

### 5) *Firefighting Equipment.*

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- *Preflight:* Inspection tags; dates; seals; proper charge levels; properly serviced; security of mounting; accessibility
- *Individual Extinguishers:* Removal; function; operation and operating techniques; cautions
- *Classes of Fires:* Appropriate extinguishers; specific firefighting techniques
- *PBE, Smoke Goggles:* Donning; use
- *Lavatory Equipment:* Integrity of trash container; spring loaded doors; smoke alarms; fire extinguishers; placards

### 6) *Emergency Exits.*

- *Exits with Slides or Slide Rafts:* Preflight door seals; integrity and condition of girt bar and brackets; slide or slide raft connections and pressure indicators; slide or slide raft engaging/disengaging mechanism; markings and placards; door opening controls; signs; lights; assist handles; function; operation, including under adverse conditions; impact of wind, weather, and fire on slides
- *Window Exits:* Preflight window seals, window opening controls, markings, placards, signs, lights, tactile indicators for non-visual conditions; function; operation and positioning, including under adverse conditions

### 7) *Exits Without Slides:* Preflight door seals; door opening controls; markings and placards; signs; lights; assist handles; function; operation, including under adverse conditions.

### 8) *Additional Emergency Equipment.*

- *Preflight:* Equipment integrity; equipment accessibility
- *Cockpit Key, Demo Equipment, CPR Equipment, Seatbelt Extensions, Lavatory Smoke Detectors:* Function; use

### **4.23.4.15. EMERGENCY SITUATION TRAINING MODULES.** Emergency situation training

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modules consist of instruction, demonstration, and practice in the handling of emergency situations common to all aircraft on which the student is qualifying in the operator's fleet. "Emergency situation" training provides the opportunity for the student to correlate the concepts developed in "emergency equipment" training with the procedural applications of various types of emergency situations that can occur. For example, this training could include instruction on the use of a water extinguisher on a seat cushion fire. To reinforce the development of these procedural concepts, emergency situation training should incorporate situational problem solving activities that depict in flight emergencies. These simulations should be as realistic as possible and should reflect the operator's type of operation.

**NOTE:** Instruction for specific emergency assignments and procedures for each aircraft are addressed under aircraft specific emergency training which is included in the CCM aircraft ground training curriculum segment (see Section 5 of this chapter).

**A. Training Criteria.** Emergency situation training should be developed to ensure that CCMs meet the following knowledge and ability criteria:

- Knowledge of crew coordination, emergency procedures, and emergency equipment
- Knowledge of each crew member's emergency procedures, signals, and safety related duties
- Ability to recognize an emergency situation and select appropriate procedures
- Ability to take the initiative and promptly implement the appropriate emergency procedures
- Ability to assume decisive leadership in the event flight crew members are incapacitated or unable to participate
- Knowledge of requirements for reporting accidents and incidents

**B. Training Module Content.** The following are examples of training modules for the emergency situation subject area. These examples of training modules encompass different types of operations and may not be applicable to an operator's specific type of operation. It should be noted that there are elements and events contained in these training modules which are not specified in the regulations but which are intended to provide Inspectors with further examples of material that may be included in training modules. These are examples only and are not

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intended to indicate the only acceptable methods, sequence of instructional delivery, subject titles, or amount of detail.

### 1) *Basic Principles.*

- *General:* Types of emergencies; need for standardization of procedures between crew members; crew coordination and communication, including team responsibilities, assertive command and control, response initiation, passenger behavior and management

### 2) *Decompression.*

- *General:* Causes and recognition of cabin pressure loss; physiological effects of reduced atmospheric pressure; time of useful consciousness
- *Rapid Decompression (Immediate Action/ Secondary Action Procedures):* Possible causes; cabin effects; physiological effects; crew coordination procedures; “immediate action procedures,” including recognition of signs of decompression, grasping nearest oxygen mask, sitting down or holding onto something solid, waiting for notification from the flight deck before moving around; “secondary action procedures,” including obtaining and putting on portable oxygen, checking other CCMs, assisting passengers, treating injuries, damage assessment and control
- *Insidious Decompression:* Possible causes; cabin effects; physiological effects; crew coordination; immediate action procedures
- *Cracked Window/Pressure Seal Leaks:* Cabin effects; crew coordination; immediate action procedures

### 3) *Fires.*

- *Principles of Combustion and Classes of Fires:* Characteristics of an aircraft fire, including flash over and time element; toxic fumes and chemical irritants; review of function and use of firefighting equipment; firefighting techniques; special factors, including cabin material flammability and toxicity; confined space; cabin ventilation
- *Fire Prevention:* CCM readiness; cabin checks, including stowage of articles which

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could contribute to fire; lavatory checks, including condition of trash container, spring loaded door, smoke detectors, and fire extinguishers; galley checks, including ovens and electrical equipment; enforcement of smoking regulations; procedures for use of circuit breakers

- *Basic Firefighting Procedures:* Flight crew member notification procedures; source identification; firefighting and crew coordination procedures; proper use of PBE; effective use of aircraft communication systems; methods of gaining access to a fire source; smoke control and removal procedures
- *Extinguishing Cabin Fires:* Crew coordination, including team response; procedures for extinguishing cabin fires to include lavatories; galleys/lower lobe galleys; ovens; volatile fuel vapors; light ballasts; cabin furnishings; stowage bins/hat racks; trash containers; clothing
- *External Fires on Ground:* Crew coordination; role of CCMs for exterior aircraft, APU, jetway, ramp fires
- *Electrical Equipment and Circuit Breakers:* Procedures for circuit breaker use with galleys, service centers, lifts, lavatories, and movie screens

### 4) Ditching.

- *Basic Practices:* Description of ditching and unanticipated water landings (prior to impact/after impact); crew notification, including time before touchdown, type of landing, signal to assume protective brace position; crew coordination, including cabin and passenger preparation; passenger briefings; helper briefing; passenger protective brace positions; CCM protective brace positions (forward facing jump seat—head forward, aft facing jump seat—head back); impact on water; assessing conditions; commands; opening primary/secondary exits; use of flotation devices; evacuation at over wing exits including use of escape ropes; redirection techniques; evacuating persons needing assistance; passenger control
- *Prior to Impact—Unanticipated* CCM readiness; protective brace positions; commanding passengers to assume protective brace positions
- *After Impact—Unanticipated* Assessing conditions; crew coordination procedures;

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releasing CCM seatbelts; ensuring activation of emergency lights; commanding passengers to release seatbelts and don individual flotation devices; assessing exits; redirection techniques; opening exits, including deploying flotation devices and commanding helpers to assist; commanding passengers to evacuate at exit, inflate vests, and use flotation devices; assisting incapacitated passengers and crew members; removing appropriate emergency equipment from aircraft

- *Prior to Impact—Anticipated* Crew notification and coordination; passenger briefing and preparation; donning life vests; cabin preparation; helper briefings; assuming protective brace positions; CCM review of ditching duties
- *After Impact—Anticipated* Assessing conditions; crew coordination procedures; releasing CCM seatbelts; ensuring activation of emergency lights; commanding passengers to release seatbelts; assessing exits; redirection techniques; opening exits, including deploying slide rafts or launching rafts, commanding helpers to assist; commanding passengers to evacuate at exit, inflate life vests, and board slide rafts or rafts; assisting incapacitated passengers and crew members; removing appropriate emergency equipment from aircraft
- *Evacuation Techniques*: Airplane flotation characteristics; adverse conditions; assisting handicapped; directing passenger flow; boarding rafts
- *Survival at Sea*: Raft management; basic survival procedures in a raft environment; signaling

### 5) *Ground Evacuation.*

- *Basic Practices*: Description of unanticipated and anticipated evacuations (prior to impact/ after impact); crew notification, including time before touchdown, type of landing, signal to assume protective brace position; crew coordination, including cabin and passenger preparation; passenger briefings; helper briefings; passenger protective brace positions; CCM protective brace positions (forward facing jump seat—head forward, aft facing jump seat—head back); impact and post-crash fire; assessing conditions; initiation evacuation; commands; opening primary/ secondary exits; evacuation at over wing exits, including use of escape ropes; redirection techniques; evacuating persons who may need assistance; passenger control Prior to Impact—Unanticipated: CCM readiness; assuming protective positions; commanding

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passengers to assume protective positions

- *Prior to Impact—Anticipated* Crew notification and coordination; passenger briefing and preparation; cabin preparation; helper briefings; assuming protective positions; CCM review of evacuation duties
- *After Impact—Unanticipated or Anticipated* Assessing conditions; crew coordination procedures; releasing CCM seatbelts; ensuring activation of emergency lights; initiation of evacuation, including decision and signal to evacuate or not to evacuate; commanding passengers to release seatbelts and evacuate; assessing exits; redirection techniques; opening exits, including deploying slides; commanding helpers to assist; commanding passengers to evacuate at exit and run away from aircraft; assisting incapacitated passengers and crew members; removing appropriate emergency equipment from aircraft
- *Evacuation Techniques*: Aircraft landing attitudes; adverse conditions; assisting handicapped; directing passenger flow; slide egress
- *Post-Crash Rescue*: Role of CCMs
- *Survival in Uninhabited Area*: Group management; basic survival procedures on land

### 6) *Unwarranted Evacuation.*

- *Passenger or Crew Initiated*: CCM readiness; assessing situation
- *Crew Coordination*: Method of communicating that an unwarranted evacuation is in progress
- *Stopping the Evacuation*: Commands; actions

### 7) *Illness or Injury.*

- *General Principles of Care*: Effects of aircraft environment; crew medical responsibilities; crew coordination, including flight crew notification; requesting and verification of medically qualified personnel; rules for administering medication; documentation and written reports; ground to air assistance; removal of ill or injured

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passengers

- *In flight Medical Emergencies/Incidents:* Illness or injury symptom recognition and examination; attempt to obtain medical history; assessment of passenger; appropriate medical treatments; handling of passenger; aircraft limitations; crew member incapacitation; apparent death in flight; review of contents and use of first aid equipment

### 8) *Abnormal situations Involving Passengers or Crew Members.*

- *Passenger Abuse of CCM:* Crew coordination; recommended procedures
- *Passengers Who Appear to be Under the Influence of Psychoactive Substances:* Crew coordination; recommended procedures
- *Passengers Who May Jeopardize Aircraft or Passenger Safety:* Crew coordination; recommended procedures

### 9) *Hijacking/Bomb Threat.*

- *Hijacking:* Specific company hijacking procedures; reinforcement of security training procedures; methods of communicating with other crew members when hijacking is threatened or in progress
- *Bomb Threat:* Specific company security procedures; reinforcement of security training procedures; crew coordination procedures; specific bomb search procedures; bomb handling and stabilization procedures for each aircraft

### 10) *Turbulence.*

- *Basic Action (Dependent on Severity of Turbulence):* Flight crew member notification procedures; communication procedures for securing passengers, crew members, cabin, galleys, serving carts
- *Severe Turbulence (Anticipated or Unanticipated):* Crew coordination procedures; appropriate actions

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- *Mild Turbulence (Anticipated or Unanticipated)*: Crew coordination procedures; appropriate actions

### 11) *Other Unusual situations (Recommended, but not Required).*

- *Blown Tires*: CCM readiness
- *Condensation*: Passenger briefing; appropriate actions
- *Engine Shutdown*: Passenger briefing; appropriate actions
- *Engine/APU Torching*: Passenger briefing
- *Fuel Dumping*: Passenger briefing; appropriate actions
- *Rejected Landing/Missed Approach/Rejected Takeoff*: CCM readiness
- *Malfunction of Lift Safety Interlock System*: Immediate actions and appropriate procedures

### 12) *Previous Accidents and Incidents.*

- *General*: Types and major causes of accidents; SSAIB and NTSB recommendations; survivability factors, including crew member and passenger preparation for impact; ability of aircraft to withstand impact; ability of crew members to perform assigned duties after impact; emphasis on crew coordination and communication as critical elements in emergency situations
- *Accident/Incident Aftermath*: Coping with survival

### 13) *Planned Evacuation Briefings.*

- a) Background. During a study, the US NTSB reviewed both planned and unplanned evacuations. The majority of cases (31) in the study were reported to be unplanned evacuations and 14 were carried out following crew planning for a possible evacuation. For the planned evacuations, the amount of planning varied from case to case. Prior to landing in an Airbus A320 that had an unsafe nose gear, the cabin crew members

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completed a comprehensive preparation for landing that included relocating the passengers and a detailed passenger briefing to prepare them for the evacuation. No passengers received injuries during the successful evacuation. In another case, passengers were informed that a maintenance problem had occurred and the aircraft would be returning to the aerodrome. Cabin crew members calmed and reassured the passengers but did not prepare the cabin for an emergency evacuation. In this case, 11 passengers sustained minor injuries.

- Planning for evacuations involves more than just keeping passengers calm. Reviewing brace positions improves the chance that passengers will properly brace themselves for the emergency landing. Planned evacuations also allow the cabin crew members to inform the passengers of what to expect, thereby avoiding surprises that could possibly delay the evacuation. For example, passengers who were flying on a Beech 1900 reported that they were surprised that there were no slides at the exits.
- Inadequate time to prepare, no procedures for abbreviated briefings, and lack of communication from the flight crew regarding the possibility of an evacuation prevented adequate passenger briefings in several cases studied.

b) Policy. Passengers who are informed and briefed regarding the possibility of an evacuation are better prepared to handle an evacuation, should one occur. Operators should ensure that they have procedures in place to encourage communication from the flight crew to the cabin crew members regarding the possibility of an evacuation. In addition, operators should have procedures in place to ensure that crewmembers provide passengers with precautionary briefings when flight crews anticipate an eventual evacuation.

- Further, operators should develop procedures that are designed to accommodate abbreviated timeframes for cabin preparation for a planned evacuation or ditching. They should establish guidance and procedures for their cabin crew members that specifically address reduced timeframes for cabin preparation and give their cabin crew members the opportunity to practice these procedures during emergency training. These procedures should prioritize the cabin preparation tasks and critical elements of passenger information that can have a maximum positive effect on an evacuation and can be delivered in an abbreviated timeframe. For example, a review of the brace position and a

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reminder to review the safety information card for exit location and operation provides passengers with information that they can use to prepare for a safer and more efficient evacuation.

- There are several methods that an air carrier may employ to accomplish this. For example, an operator could have one announcement/checklist and structure it so that tasks are completed in order of importance. Even an abbreviated timeframe would allow the most critical tasks to be completed first. Another method could be to have two different announcements/checklists to accomplish specific timeframes such as “over 10 minutes to prepare/under 10 minutes to prepare.” Regardless of the method the operator chooses, Inspectors should ensure that their assigned operators have procedures in place that are able to accommodate abbreviated timeframes for cabin preparation for an emergency landing.

**4.23.4.17. AIRCRAFT SPECIFIC EMERGENCY SUBJECTS TRAINING MODULES.** Modules for aircraft specific emergency training consist of instruction in the location, function, and operation of emergency equipment; crew member emergency assignments and procedures, including crew coordination and communication; the handling of emergency or other unusual situations; and emergency drills that are specific to the aircraft the crew member is qualifying for in the operator’s fleet.

**A. Definition of Aircraft Specific Emergency Training Area.** The aircraft specific emergency equipment and the aircraft specific emergency training drills should be taught under the Aircraft Specific Emergency Training Subject area if not previously taught under the General Emergency Training Curriculum Segment. For example, if all aircraft in an operator’s fleet are equipped with the same type of halon fire extinguisher, this fire extinguisher would be taught as “general” to all aircraft in the CCM General Emergency Training Curriculum Segment. If, however, the specific aircraft in the operator’s fleet is equipped with various types of halon fire extinguishers, each fire extinguisher would be taught as “aircraft specific” in the CCM Aircraft Ground Training Curriculum Segment.

**B. Minimum Requirements.** Aircraft specific training must include training in at least the following, with respect to each aircraft make, model, type, series, and configuration; each required crewmember; and each kind of operation conducted:

- Instruction in emergency assignments and procedures, including coordination among crew

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members

- Instruction in the location, function, and operation of emergency equipment
  - Instruction in the handling of emergency situations
  - Review of previous aircraft accidents and incidents
  - Required emergency drills
- 1) Airplane specific emergency training modules may also include any additional information pertinent to the aircraft equipment and furnishings CCMs need to be familiar with in order to perform assigned duties.
- 2) Airplane specific emergency training modules may also include instruction on procedures for an emergency situation that is specific to the aircraft on which training is being conducted.

**C. Training Module Content.** The following are examples of training modules for the aircraft specific emergency training. These examples of training modules encompass different types of operations and may not be applicable to a specific operator's type of operation. It should be noted that there are elements and events contained in these training modules that are not specified in the GACAR, but are intended to provide Inspectors with further examples of material that may be included in training modules. These are examples and are not intended to indicate the sole acceptable method, sequence of instructional delivery, subject titles, or amount of detail.

1) *Emergency Equipment.* The emergency equipment modules should be accomplished only if they have not been accomplished previously under the General Emergency Training Curriculum Segment. Only the training modules that are unique to the aircraft and type of operation need to be accomplished. Detailed elements pertaining to each of the Emergency Equipment Training Modules are located in "Cabin Crew Member General Emergency Training Curriculum Segments", in Section 4 of this chapter.

a) *Aircraft Exits:* Location and description of emergency operation of exit including emergency escape system and backup procedures.

b) *Exits with Slides or Slide rafts Emergency Operation:*

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1. Procedures for arming exit in emergency mode including the following:

- Ensuring that door is fully closed and locked
- Checking to see that threshold is free of debris
- Arming door either manually or automatically
- Verifying girt bar engagement

2. Procedures for opening exit in emergency mode including the following:

- Assessing conditions prior to opening exit
- Assuming correct body protective position for door opening
- Operating door controls correctly
- Ensuring that door is in open and in locked position
- Using manual slide inflation system to accomplish or ensure slide or slide raft deployment and inflation
- Assessing condition of and stabilizing slide or slide raft
- Using slide as hand held escape device (if applicable)
- Operating exit under adverse conditions including impact of wind, weather, and fire on slide
- Passing expeditiously through exit
- Assessing and following a safe path away from exit

c) *Slides and Slide Rafts in a Ditching:*

- Identification of exits and slides or slide rafts usable in ditching

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- Deactivation of unusable slides or slide rafts
- Deployment, inflation, and detachment of slides or slide rafts from aircraft
- Overwing evacuation procedures including slide or slide raft operation
- Movement of slides or slide rafts from door to door; use of door mounted slides as raft boarding platforms
- Use of door mounted slides as flotation devices; boarding techniques
- Detachment of mooring line from aircraft

d) *Exits without Slides—Emergency Operation* Procedures for opening exit including the following:

- Assessing conditions before opening
- Assuming correct body protective position for door opening, operating door controls correctly
- Securing exit in open and locked position
- Using emergency airstair system to lower stairs (as applicable)
- Operating exit under adverse conditions
- Passing expeditiously through exit
- Assessing and following a safe path away from exit

e) *Window Exits—Emergency Operation* Procedures for opening exit including the following:

- Assessing conditions prior to opening
- Using tactile indicators to locate window exit

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- Assuming correct body protective position for window opening
- Operating window controls correctly
- Positioning window to preclude evacuation obstruction
- Using escape ropes
- Operating exit under adverse conditions
- Passing expeditiously through exit
- Assessing and following a safe path away from exit

f) *Exits with Tail Cones—Emergency Operation*

1. Procedures for arming exit in emergency mode, if applicable.
2. Procedures for opening exit including the following:
  - Assessing conditions prior to opening
  - Removing emergency handle protective device (as applicable)
  - Assuming correct body protective position for door opening
  - Operating door controls and emergency handle correctly
  - Ensuring that door is in an open and locked position or positioning hatch to preclude evacuation obstruction, if applicable
  - Walking on catwalk
  - Locating and using jettison handle to accomplish tail cone jettison or as backup procedure
  - Using manual slide inflation system to ensure slide deployment and inflation

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- Assessing condition of and stabilizing slide
- Operating exit under adverse conditions including impact of wind, weather, and fire on slide
- Assuming correct body protective position on assist platform
- Passing expeditiously through exit
- Assessing and following a safe path away from exit

g) *Cockpit Exits—Emergency Operation* Procedures for opening exit including the following:

- Assessing conditions prior to opening
- Assuming correct body position for exit opening
- Operating exit controls correctly
- Using escape ropes and inertial escape reels
- Exit operation under adverse conditions
- Passing expeditiously through exit
- Assessing and following a safe path away from exit

h) *Ground Evacuation and Ditching Equipment*: Description of the operation, function, preflight, removal (as applicable), and operation of the evacuation equipment including slide or slide rafts; aircraft emergency landing attitudes.

i) *First Aid Equipment*: Review of the location and number; description of the function, preflight, removal, and operation of the first aid equipment, emergency medical kit, and first aid kit.

j) *Portable Oxygen Systems (Oxygen Bottles, Chemical Oxygen Generators, Protective Breathing Equipment (PBE))*:

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- Review of the location and number
  - Description of the function
  - Preflight, removal, and operation of the oxygen systems
- k) *Firefighting Equipment:* Review of the location and number; description of the function, preflight, removal (as applicable), and operation of the firefighting equipment.
- l) *Communications—Emergency Notification Systems:* Description, location, function, and operation of evacuation alerting devices, smoke or fire detection warning systems, decompression alerting devices including controls and indicators; system inoperative procedures; system resetting procedures.
- m) *Emergency Lighting Systems:* Description, location, function, and operation of emergency lighting including the following:
- Exit signs and arrows
  - Floor proximity escape path
  - Cabin lighting
  - Exterior lighting
  - Switches and testing procedures
- n) *Additional Emergency Equipment:* As applicable, the description of the location, function, preflight, removal, and operation of any additional unique emergency equipment, such as cargo barrier nets, smoke barriers, firefighting extension wands.
- 2) *Emergency Assignments and Procedures.* The following Emergency Assignments and Procedures Training Module should be accomplished in conjunction with the Emergency situation Training Modules and Elements outlined in the General Emergency Training Curriculum Segment in section 4 of this chapter. Only the training modules that are unique to the aircraft and type of operation need to be accomplished. For detailed elements pertaining to each of the Emergency Assignments and Procedures Training Modules, refer to

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the General Emergency Training Curriculum Segment—Emergency situation Training Modules in section 4 of this chapter.

a) *General*: Types of emergencies specific to aircraft including the following:

- Standardization of procedures among crewmembers
- Crew coordination and communication
- Utilization and implementation of emergency equipment and emergency assignments that are appropriate to the specific

b) *Emergency Communication signals and Procedures*:

1. Review of location, function, and operation of emergency communication systems on specific aircraft.
2. Description of specific cockpit including cabin chime and inter phone signals for emergency situations including the following:

- Flight crew member notification of emergency situation
- Flight crew member notification of attempted hijacking
- Flight crew member notification that an evacuation is being initiated
- Flight crew member signal to evacuate or not to evacuate

c) *Rapid Decompression*: Crew members' emergency duties, procedures, and commands for rapid decompression

d) *Insidious Decompression and Cracked Window and Pressure Seal Leaks*: Crew members' emergency duties, procedures, and commands for insidious decompression and cracked window and pressure seal leaks.

e) *Fires*: Crew members' emergency duties, procedures, and commands for the extinguishing of cabin fires.

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- f) *Ditching*: Crew members' specific emergency assignments, procedures, and commands for an unanticipated water landing (prior to impact and after impact) and anticipated ditching (prior to impact and after impact).
- g) *Ground Evacuation*: Crew members' specific emergency assignments, procedures, and commands for an unanticipated ground evacuation (prior to impact and after impact) and anticipated ground evacuation (prior to impact and after impact).
- h) *Unwarranted Evacuation*: Crew members' duties, procedures, and commands for an unwarranted evacuation.
- (i) *Illness or Injury*: Crew members' duties, procedures, and commands for the handling of passenger illness or injury.
- (j) *Abnormal situations Involving Passengers or Crew Members*: Crew members' duties, procedures, and commands for abnormal situations involving the following:
- Passenger abuse of CCMs
  - Passengers who appear to be under the influence of psychoactive substances
  - Passengers who may jeopardize aircraft or passenger safety
- k) *Hijacking*: Crew members' duties, procedures, and commands for the handling of a hijacking (this may be part of the Security Training Curriculum).
- l) *Bomb Threat*: Crew members' duties, procedures, and commands for the handling of a bomb threat (this may be part of the Security Training Curriculum).
- m) *Turbulence*: Crew members' duties, procedures, and commands for severe turbulence (anticipated or unanticipated) and mild to moderate turbulence (anticipated or unanticipated).
- n) *Unusual situations*: Description of crew members' duties, procedures, and commands for other unusual situations.
- o) *Accidents and Incidents*: Description of previous aircraft accidents and incidents.

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3) *Aircraft Specific Emergency Drills.* The following Aircraft Specific Emergency Drills Training Modules should be accomplished only if they have not been accomplished previously under the General Emergency Training Curriculum Segment. Aircraft Specific Emergency Drills Training Modules should be accomplished in conjunction with the Emergency Drills Training outlined in the General Emergency Training Curriculum Segment. For detailed elements pertaining to each of the Emergency Equipment Training Modules, refer to the General Emergency Training Curriculum Segment—Emergency Drills Training Modules in section 4 of this chapter.

- a) *Emergency Exit Drill:* During an emergency exit drill, each student must operate every type of emergency exit in the normal and emergency modes, including the actions and forces required for deployment of the emergency evacuation slides.
- b) *Hand Fire Extinguisher Drill:* During a hand fire extinguisher drill, each student must operate every type of installed hand fire extinguisher.
- c) *Emergency Oxygen System Drill:* During an emergency oxygen system drill, each student must operate every type of emergency oxygen system, including PBE.
- d) *Flotation Device Drill:* During a flotation device drill, each student must put on, use, and inflate (as applicable) one type of individual flotation device.
- e) *Ditching Drill (if applicable):* During a ditching drill, each student must perform the “prior to impact” and “after impact” procedures for a ditching, as appropriate to the operator’s specific type of operation.
- f) *Life raft Removal and Inflation Drill (if applicable):* During a life raft removal and inflation drill, each student must observe the removal of a life raft from the aircraft or training device, as well as the inflation of a life raft.
- g) *Slide raft Pack Transfer Drill (if applicable):* During a slide raft transfer drill, each student must observe the transfer of each type of slide raft pack from an unusable door to a usable door.
- h) *Slide or Slide raft Deployment, Inflation, and Detachment Drill (if applicable):* During a slide or slide raft deployment, inflation, and detachment drill, students must observe the deployment, inflation, and detachment of the slide or slide raft pack from the

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aircraft or training device.

- i) *Emergency Evacuation Slide Drill (if applicable):* During an emergency evacuation slide drill, students must observe the deployment and inflation of an evacuation slide, including participants egressing from the cabin or approved training device via the evacuation slide.

### **4.23.4.19. HANDLING OF CARRY-ON BAGGAGE DURING AN AIRCRAFT EVACUATION.**

**A. Background.** Typically, operators use two methods to instruct passengers not to take personal belongings during an evacuation. The first method is an indication on the safety briefing card that carry-on baggage should not be taken during an emergency evacuation. The second method is a cabin crew member commanding all passengers to “leave everything” during an evacuation. Even with these methods in place, the US NTSB reported that many of the passengers that were interviewed during their study were carrying at least one piece of carry-on baggage when they attempted to evacuate the aircraft. Operators should develop advisory material to address ways to minimize the problems associated with carry-on baggage during evacuations.

**B. Policy.** Passengers who attempt to retrieve and bring their carry-on baggage with them as they exit the aircraft have the potential to slow the evacuation, damage the escape slide, and injure other passengers at the bottom of the slide. Cabin crew members should be forceful and commanding as they instruct passengers to leave everything on the aircraft.

- 1) During an emergency evacuation, when a passenger disregards a cabin crew members command to leave everything on the aircraft and approaches an exit while carrying a piece of carry-on baggage, cabin crew members should be prepared to take specific actions. GACA guidance, as published in FAA Advisory Circular (AC) 121-29 (as amended), Carry-On Baggage states that operators should develop procedures to handle carry-on baggage during an evacuation, teach the procedures to cabin crew members as part of their approved training program, and practice the procedures during evacuation drills.
- 2) Operators that have procedures currently in place to address the handling of carry-on baggage during an evacuation usually train cabin crew members to take the bag and throw it to a specific area to mitigate the negative effects that it may have on the evacuation. This could include throwing it out of the aircraft forward or aft of the evacuation slide, throwing it back into the cabin into empty seats, etc. Procedures would have to take into

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consideration the cabin crew member's location on the aircraft (floor level or over wing exit) as well as the hazards of piling up carry-on baggage in front of another exit or the flight deck door, or throwing it down the slide on top of other passengers. Another consideration is the fact that a battle with a passenger over a piece of carry-on baggage may be more detrimental to the rapid egress of the aircraft than allowing the passenger to take it with them.

3) Inspectors should work with their assigned operators to ensure that they have specific procedures in the appropriate crew member manuals and training programs that address the handling of carry-on baggage during an emergency and provide their cabin crew members with clear direction and guidance.

### **4.23.4.21. EMERGENCY DRILL TRAINING MODULES.**

**A. General.** Emergency drill training modules provide an opportunity for CCMs to gain experience in the performance of emergency procedures with the actual operation of emergency or safety equipment. Emergency drill training consists of an integration of emergency equipment, emergency situation, and aircraft specific training. These drills can be taught as either general to all aircrafts or as aircraft specific. For example, if all aircrafts in an operator's fleet are equipped with the same type of portable oxygen bottle, the emergency drill would be taught as "general" to all aircraft. If, however, the aircraft in an operator's fleet are equipped with various types of portable oxygen bottles, the emergency drill would be taught as "aircraft specific." The sequence of emergency drill training should be adjusted according to the complexity of the operator's type and number of aircraft, training mock ups, and other training devices. For certain emergency drills it is appropriate to sequence emergency drill training after aircraft specific training. For example, emergency drill training on emergency exits is more effective after training on the functions and controls of the emergency exits for specific aircraft. Emergency drill training is the performance and demonstration phase of emergency training. The objective of this training is to train each CCM to proficiency by reinforcing the concepts developed in the instruction phase of emergency training. The drills require the use of the specific type of emergency equipment as the equipment that is installed on the operator's aircraft. The equipment must have the identical dimensions, mass, forces, and specifications. Each of the drills should be as realistic as possible. For example, if artificial smoke is not used in an emergency evacuation drill, attempts should be made to simulate darkened conditions.

**B. Training Criteria.** Emergency drill training should be developed to ensure that CCMs obtain proficiency in emergency situations and have the ability to do the following:

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- Correctly preflight and prepare emergency/safety equipment for each type of aircraft (when part of assigned duties)
- Identify the type of emergency and correctly use the appropriate emergency equipment
- Exercise good judgment in assessing an emergency situation
- Implement the appropriate emergency procedures and to coordinate actions and signals with other crew members
- Operate emergency/safety equipment for each type of aircraft
- Communicate effectively with crew members and passengers in an emergency situation

### **4.23.4.23. EMERGENCY DRILLS.**

**A. Onetime Emergency Drill Requirements.** The GACA requires CCMs to accomplish the following emergency drills at least one time during initial new hire training (for the onetime emergency drill requirements of transition training, see Section 5 of this chapter). Included with each emergency drill are recommended elements or events that CCMs should be able to demonstrate satisfactorily.

1) *PBE Firefighting Drill.* During a PBE fire-fighting drill, the student is required to fight an “actual” fire by actually discharging a fire extinguisher charged with the appropriate fire retardant agent while wearing PBE. The student must wear PBE while fighting the actual fire. The following recommended elements and events apply to fighting the fire:

- *Approach to Fire/Smoke:* Ability to locate source of fire or smoke
- *Crew Coordination:* Ability to implement procedures for effective crew coordination and communication, including notification of flight crew members about fire situation
- *Donning and Activating PBE:* Ability to maneuver in limited space with reduced visibility and to effectively use the aircraft’s communication system
- *Selection of Appropriate Fire Extinguisher:* Ability to identify class of fire; to select the appropriate extinguisher; to properly remove extinguisher from securing device

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- *Actual Discharge of Fire Extinguisher on Fire:* Ability to prepare extinguisher for use; to operate and discharge extinguisher properly; to utilize correct firefighting techniques for type of fire
- *Fire Saturation:* Ability to completely extinguish fire
- *Emergency Evacuation Drill:* During an emergency evacuation drill, each student is required to egress the aircraft or approved training device using at least one type of installed emergency evacuation slide.
- *Prior to Impact:* Ability to recognize and evaluate emergency; to assume appropriate protective position; to command passengers to assume protective position
- *After Impact:* Ability to implement crew coordination procedures; to release seatbelt; to ensure activation of emergency lights; to assess aircraft conditions; to initiate evacuation (dependent on signal or decision); to command passengers to release seatbelts and evacuate; to assess exit and redirect, if necessary; to open exit, including deploying slides and commanding helpers to assist; to command passengers to evacuate at exit and run away from aircraft
- *Actual Exit on Emergency Evacuation Slide:* Ability to correctly jump onto slide; to maintain correct body position while sliding; to land on feet and run away from aircraft
- *Special Sliding Techniques:* Awareness of methods for assisting special need passengers, such as handicapped, elderly, and persons in a state of panic

**B. Additional Emergency Drill Requirements.** Students must accomplish the following emergency drills during initial new hire and initial equipment training, and once every 24 calendar months during recurrent training. Included with each emergency drill are recommended elements or events that CCMs should be able to demonstrate satisfactorily.

1) *Emergency Exit Drill.* During an emergency exit drill, students must operate each type of emergency exit in the normal and emergency modes, including the actions and forces required for deployment of the emergency evacuation slides.

- *Preflight Exit:* Ability to correctly preflight each type of emergency exit and evacuation slide or slide raft (if part of CCM's assigned duties)

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- *Actual Disarming and Opening of Each Type of Door Exit in Normal Mode:* Ability to open exit properly by disarming door either manually or automatically; to verify girt bar disengagement; to assume correct body position; to use door controls correctly; to secure exit in open and locked position; to secure safety strap
- *Actual Closing of Each Type of Door Exit in Normal Mode:* Ability to close exit properly by removing safety strap (if installed); to release locking mechanism; to assume correct body position; to use door controls correctly; to secure exit in closed and locked position
- *Actual Arming of Each Type of Door Exit in Emergency Mode:* Ability to arm exit properly by checking if threshold is free of debris; to arm door either manually or automatically; to verify girt bar engagement
- *Actual Opening of Each Type of Door Exit in Emergency Mode:* Ability to open exit properly by assuming correct body/protective position; to use door controls correctly; to ensure that door is in open and locked position; to use manual slide inflation system to accomplish or ensure slide or slide raft inflation
- *Actual Opening of Each Type of Window Exit:* Ability to open exit properly by assuming correct body/protective position; to use controls correctly; to place window safely; to remove escape rope and position for use

2) *Hand Fire Extinguisher Drill.* During a hand fire extinguisher drill, students must operate and discharge each type of installed hand fire extinguisher (such as Halon 1211, water, carbon dioxide, and dry chemical fire extinguishers). Fighting an actual or a simulated fire is not necessary during this drill.

- *Preflight:* Ability to correctly preflight each type of hand fire extinguisher (if part of CCM's assigned duties)
- *Operation:* Ability to correctly operate each type of hand fire extinguisher and to implement appropriate firefighting procedures; to locate source of fire or smoke and identify class of fire; to select appropriate extinguisher and remove from securing device; to prepare extinguisher for use; to actually operate and discharge extinguisher; to use correct fire-fighting techniques for type of fire

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**NOTE:** The discharge of Halon extinguishing agents during firefighting drills is not appropriate, unless a training facility is used that is specifically designed to prevent harm to the environment from the discharged Halon. When such facilities are not used, other fire extinguishing agents that are not damaging to the environment should be used during the drills.

- *Crew Coordination:* Ability to implement procedures for effective crew coordination and communication, including notification of flight crew members about the type of fire situation

3) *Emergency Oxygen System Drill.* During an emergency oxygen system drill, each student must operate each type of emergency oxygen system, including PBE.

- *Preflight and Operation of Portable Oxygen Devices:* Ability to correctly preflight (if part of CCM's assigned duties) and operate portable oxygen bottles, including masks and tubing; ability to preflight and verbally demonstrate operation of chemical oxygen generators, including procedures for administering oxygen
- *Administering Oxygen from Portable Oxygen Bottles:* Ability to properly remove from securing device; to prepare for use; to operate oxygen device properly, including donning and activation; to administer oxygen to self, passengers, and to those persons with special oxygen needs; to utilize proper procedures for effective crew coordination and communication
- *Preflight and Operation of PBE:* Ability to correctly preflight (if required) and properly put on equipment; to actually activate equipment and maneuver in limited space with reduced visibility; to utilize the aircraft's communication system for effective crew coordination

**NOTE:** Several operators equip their aircraft with approved PBE units that have approved storage pouches fastened with two metal staples at one end. However, considerations of practicality and cost compel operators to use a less durable storage pouch that lacks the staple fasteners for training purposes. As a result, pilots and CCMs have been surprised that opening the pouch furnished on board requires more force than opening the training pouch. Inspectors should require crew member training that includes the appropriate procedures for operating PBE. In those cases where pouches with staples are used for storage of the PBE unit, special emphasis in training should highlight the difference between the training

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pouch and the onboard pouch.

- *Use of Aircraft Oxygen System:* Ability to manually open each type of oxygen mask compartment and deploy oxygen masks; to identify compartments with extra oxygen masks; to implement immediate action decompression procedures; to reset

4) *Flotation Device Drill.* During a flotation device drill, the student must put on, use, and inflate (as applicable) each type of individual flotation device.

- *Preflight:* Ability to correctly preflight (if part of CCM's assigned duties) each type of individual flotation device
- *Donning and Inflating Life Vests:* Ability to locate and remove from packaging; to properly put on and inflate (automatically and manually); to activate and deactivate locator light; to put on a small child or infant; to instruct children, non-swimmers, handicapped, and elderly on how to use and when to inflate; to demonstrate swimming techniques with a life vest
- *Flotation Seat Cushions:* Ability to remove them from the seat and properly use them; to demonstrate swimming techniques using a seat cushion

5) *Ditching Drill (if applicable).* During a ditching drill, students must perform the “prior to impact” and “after impact” procedures for a ditching, as appropriate to the specific operator's type of operation.

- *Crew Coordination:* Ability to implement crew coordination procedures, including briefing with flight crew members to obtain pertinent ditching information and briefing CCMs; to coordinate timeframe for cabin and passenger preparation
- *Passenger Briefing:* Ability to adequately brief passengers on ditching procedures, including information on the removal and stowage of restrictive personal articles; removal, donning, inflation of life vests; positioning of seats and tray tables; stowage of carry-on baggage; securing and release of seatbelts; appropriate brace positions; location of exits; location and boarding of rafts; helper briefings
- *Passenger and Cabin Preparation:* Ability to ensure that all passenger briefing procedures are implemented properly; to ensure that cabin is prepared, including the

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securing of carry-on baggage, lavatories, and galleys

- *Launching of Slide Rafts or Rafts:* Ability to assess conditions; to demonstrate how to properly deploy and inflate slide rafts; to remove, position, attach to aircraft, and inflate rafts; to use escape ropes at over wing exits; to command helpers to assist; to use slides and seat cushions as flotation devices; to remove appropriate emergency equipment from aircraft
- *Boarding of Passengers and Crew into Slide Raft or Raft:* Ability to command passengers to exit aircraft, inflate life vests, and board rafts properly; to initiate raft management procedures, including disconnecting rafts from aircraft, applying immediate first aid, rescuing persons in water, salvaging floating rations and equipment, deploying sea anchor, tying rafts together, activating, and ensuring emergency locator transmitter in operation; to initiate basic survival procedures, including removing and using survival kit items, repairing and maintaining raft, ensuring protection from exposure, erecting canopy, communicating location, providing continued first aid, and providing sustenance
- *Use of Life Lines:* Ability to use heaving line to rescue persons in water; to tie slide rafts or rafts together; to use life line on edge of slide raft or raft as a handhold and to secure survival kit items

6) *Life Raft Removal and Inflation Drill (if applicable).* During a life raft removal and inflation drill, students must observe the removal of a life raft from the aircraft or training device, as well as the inflation of a life raft.

- *Raft Removal:* Removal of raft from raft compartment, including using correct method of handling raft; positioning raft at exit; removing raft lanyard; securely attaching raft lanyard to aircraft interior before raft launching; commanding helpers to assist
- *Raft Launching and Inflation:* Ensuring that exit is open and usable; launching raft into water and inflating raft; commanding passengers to evacuate at exit and board raft; detaching raft from aircraft; commanding helpers to assist; initiating raft management and basic survival procedures
- *Raft Launching at Window Exits:* Removing and positioning raft from raft compartment to window exit; removing raft lanyard; securely attaching raft lanyard to

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aircraft interior; ensuring that window exit is open and usable; removing escape rope and attaching to fitting on wing; carrying raft onto wing and launching raft off leading edge of wing into water; inflating raft; commanding passengers to evacuate at window exit, to walk onto wing holding escape rope, and to board raft; detaching raft from aircraft; commanding helpers to assist

7) *Slide raft Transfer Drill.* During a slide raft transfer drill, students must observe the transfer of each type of slide raft pack from an unusable door to a usable door.

- *Disconnecting Slide raft at Unusable Door:* Crew coordination procedures, assessing conditions to determine usable door, redirecting passengers to usable slide raft, completing specific steps for slide raft disconnection at unusable door
- *Slide raft Installation and Deployment at Usable Door:* Positioning slide raft pack at usable door, completing specific steps for slide raft installation at usable door

8) *Slide or Slide raft Deployment, Inflation, and Detachment Drill.* During a slide or slide raft deployment, inflation, and detachment drill, students must observe the deployment, inflation, and detachment of the slide or slide raft pack from the aircraft or training device.

- *Slides With Quick Release Handle:* Engaging slide girt bar in floor brackets; opening of door and verification of slide deployment; inflating slide either manually or automatically; disconnecting slide from aircraft for use as a flotation device
- *Slides Without Quick Release Handle:* Engaging slide girt bar in floor brackets; opening door and verifying slide deployment; disconnecting slide from aircraft; inflating slide for use as a flotation device
- *Slide rafts:* Arming slide rafts for automatic inflation; opening door and verifying inflation; disconnecting slide raft from the aircraft

9) *Emergency Evacuation Slide Drill.* During an emergency evacuation slide drill, CCMs must observe the deployment and inflation of an evacuation slide, including participants egressing from the cabin via the evacuation slide.

- *Opening Exit:* Opening armed exit with slide or slide raft deployment and inflation

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- *Evacuation of Aircraft:* Commanding the evacuation; having participants egress from aircraft via the evacuation slide and run away to a safe distance

**NOTE:** In drills 6, 7, 8, and 9, the GACA does not require CCMs to actually remove and inflate life rafts or to deploy, inflate, detach, or transfer slides or slide rafts. GACAR § 121.907(c)(2)(ii), however, requires that CCMs at least observe these drills. “Perform” is defined as the accomplishment of “a prescribed emergency drill using established procedures that stress the skill of those persons involved in the drill.” “Observe” is defined as watching “without participating actively in the drill.” When evaluating an “observed” drill, either with audiovisual aids or with participants performing the drill, the Inspector must determine whether it adequately conveys a clear understanding of each of the steps involved to perform a required function.

**4.23.4.25. GUIDELINES FOR TRAINING CABIN CREW MEMBERS ASSIGNED TO OPEN MORE THAN ONE DOOR DURING AN EMERGENCY EVACUATION.** Research conducted by the US NTSB has found that there are often situations in which individual cabin crew members are responsible for opening more than one exit. However, many recurrent training programs do not require cabin crew members to practice opening more than one exit during drills. There is a concern that usable exits will not be opened during an evacuation because the cabin crew members have not been trained to open more than one exit.

**A.** Passenger flow control management training is especially important when an individual cabin crew member is assigned to open more than one exit. Passenger flow control management is an important part of any emergency evacuation or ditching drill and should be included in all cabin crew member emergency training programs. Training programs should emphasize to cabin crew members that proper action can ensure all available exits are used efficiently. Cabin crew members should be trained to evaluate passenger use of exits and to direct passengers to another exit to increase the number of passengers evacuating the aircraft. In addition, cabin crew members should be trained to continually appraise the condition of exits and to signal and direct passengers to available exits. Air carrier training programs should include flow control management techniques during the drills required in emergency training.

**B.** In cases where the operator has a full scale cabin mock up, which contains two floor level exits opposite each other, the training program should require trainees to open both doors and demonstrate passenger flow control through both of these doors.

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**C.** When the operator trains its cabin crew members in a cabin mockup not having both assigned exits, the training program should include a drill in which cabin crew members complete the following actions:

- 1) Open the primary exit to which they are assigned.
- 2) Proceed to an area which is equal in distance from the actual second choice exit.
- 3) Simulate opening the second choice exit.
- 4) Demonstrate passenger flow control management.

**D.** When the operator does all of its training in an actual aircraft and has emergency procedures requiring individual cabin crew members to open more than one door, its training program should include a drill which requires cabin crew member trainees to open both doors and practice passenger flow control management including the signals and commands necessary to maximize passenger evacuation from the aircraft.

**E.** Cabin crew member training programs should include drills during emergency training in which cabin crew members practice opening both exits or simulate opening a second choice exit. In both cases, cabin crew members should demonstrate the skills associated with passenger flow control management. Inspectors assigned to operators having procedures in which individual cabin crew members are expected to open more than one floor level exit during an aircraft emergency evacuation should ensure that cabin crew members are trained on this procedure. Inspectors approving training on procedures that include a second choice exit should use the policies contained in this paragraph.

### **4.23.4.27. ADAPTATION OF GENERAL EMERGENCY TRAINING CURRICULUM**

**SEGMENTS TO THE VARIOUS CATEGORIES OF TRAINING.** The GACA requires the general emergency training curriculum segment in the following categories of training: initial new hire, recurrent, and requalification. When determining if general emergency training curriculum segments are appropriately adapted to the different categories of training, Inspectors should use Figure 4.23.4.3.

**A. Initial New Hire Category of Training.** Operators must develop and obtain approval of a general emergency training curriculum segment for the initial new hire category of training. An operator who operates both propeller powered and turbojet powered aircraft may be required to develop separate general emergency curriculum segments for incorporation into the initial new

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hire category of training appropriate to these types of aircraft.

**B. Transition Category of Training.** There is a requirement for a separate general emergency curriculum segment for the transition category of training. For this category of training, CCMs will have previously received the appropriate general emergency training during initial new hire training. Aircraft specific emergency training, however, must be included in the aircraft ground training segment of a transition curriculum. Aircraft specific emergency training may require elements that are in a general emergency training curriculum segment. For example, an operator may not operate an aircraft equipped with escape slides. If the operator subsequently adds an aircraft so equipped, training on slides must be included in transition training.

**C. Recurrent Category of Training.** GACAR Part 121 operators must develop and obtain approval for a separate general emergency training curriculum segment for the recurrent category of training. Usually, it will be appropriate to have two general emergency curriculum segments, one that reflects a 12 month cycle of emergency equipment and emergency situation training, and another that reflects a 24 month cycle of emergency drill training. It is acceptable, however, to incorporate the emergency drill “hands on” training into a single curriculum segment, provided the segment contains a requirement that CCMs must receive the emergency drill training at least once every 24 months.

**D. Requalification Category of Training Part 121.** The determination of whether a general emergency curriculum segment is appropriate for the requalification category of training depends on the length of time a CCM has been unqualified. In general, CCMs become unqualified for not completing recurrent training within the preceding 12 months

**4.23.4.29. CURRICULUM SEGMENT COMPLETION REQUIREMENTS.** An instructor or supervisor must certify completion of the curriculum segment indicating that the student has successfully completed the course. This certification is usually based on the satisfactory evaluation of a student’s performance. With some training methods, such as computer based instruction (CBI), the certification may be based on student progress checks administered during the course.

**4.23.4.31. EVALUATION OF TRAINING HOURS.**

**A.** GACAR Part 121 does not specify a minimum number of training hours for general emergency training curriculum segments. When approving these curriculum segments, the Inspector must consider the complexity of the type of operation to be conducted and the complexity of the aircraft to be used. Figure 4.23.4.3 provides guidance and direction for Inspectors when approving

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general emergency training curriculum segments. The table provides “accepted norms” for the initial new hire general emergency training hours. The purpose of having established accepted norms is to assist the Inspector when evaluating proposed programs for new operators or when evaluating proposed programs introducing new aircraft by existing operators. For a complex type of operation the training hours may need to exceed the national norm, while for a less complex type of operation the training hours below the accepted norm may be acceptable. Accepted norms have not been established for recurrent general emergency training.

**B.** Figure 4.23.4.3 lists three general levels of operational complexity.

- 1) The basic level of complexity for the initial new hire training category is considered to be “land operations.” The accepted norm for land operations is 14 hours for the general emergency training curriculum segment, which is divided into 10 hours for emergency equipment/situations and the remaining 4 hours for emergency drills.
- 2) The accepted norm for “extended overwater operations” is an additional 7 hours, which is divided into 4 hours for emergency equipment/situations and the remaining 3 hours for emergency drills.
- 3) The accepted norm for operations conducted in pressurized aircraft is an additional 3 hours, which is divided into 2 hours for emergency equipment/situations and the remaining 1 hour for emergency drills.
- 4) For an operator conducting all three operational complexities, the accepted norm is a total of 24 hours for the general emergency training curriculum segment.

**4.23.4.33. EVALUATION OF CABIN AND EXIT MOCKUPS.** Hands on emergency drill training for items such as emergency exits and passenger oxygen systems should be conducted in a static aircraft, an approved cabin mock up training device, or an approved exit mock up training device. Cabin and exit mock up training devices should be representative of a full scale section of an aircraft. Cabin mock ups should include operational doors, window exits, slides, rafts, and other equipment used in emergency drill training. Cabin or exit mock up training devices shall not be approved unless they have been evaluated by an Inspector and determined to be adequate. Generally, cabin mock ups are acceptable if they are representative of the operator’s aircraft with the appropriate equipment installed, and they are full scale in cross section. Generally, exit mock ups are acceptable if the forces required to open them closely duplicate normal and emergency conditions with the slide or slide raft installed and the mechanisms and instructions required to operate them are representative of the

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operator's aircraft.

### **4.23.4.35. EVALUATION OF CCM GENERAL EMERGENCY TRAINING CURRICULUM SEGMENT OUTLINE FOR INITIAL APPROVAL.**

**SEGMENT OUTLINE FOR INITIAL APPROVAL.** When evaluating a general emergency training curriculum segment outline for initial approval, Inspectors must determine whether the training modules contain the information required for CCMs to perform emergency duties and procedures without supervision. Inspectors should use the job aid in this section when evaluating the proposed curriculum segment outline (see Figure 4.23.4.3).

### **4.23.4.37. CCM GENERAL EMERGENCY CURRICULUM SEGMENT JOB AID.**

**A.** The CCM General Emergency Curriculum Segment Job Aid (see Figure 4.23.4.3) is provided to assist Inspectors when evaluating this curriculum segment. This job aid covers the three distinct subject areas of general emergency training: “emergency equipment” training, “emergency situation” training, and “emergency drill” training. The job aid is intended to assist Inspectors during the evaluation of individual general emergency training curriculum segment modules.

**B.** When using the job aid, an Inspector should make a side by side comparison of the operator’s proposal to make the following determinations:

- Whether the training modules provide for training on the required elements and events in terms of CCM duties and procedures
- Whether sufficient training module elements and events are outlined to ensure that the appropriate depth and scope of the material will be presented

**C.** The job aid is organized with training subjects listed vertically in the left column and evaluation criteria listed horizontally across the top. Inspectors may use the spaces within the matrix for items such as notes, comments, dates, or checkmarks. There are also blank columns and rows on the job aid for Inspectors to include additional training modules or evaluation criteria.

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Figure 4.23.4.3. CCM General Emergency Curriculum Segment Job Aid

<b>TRAINING SUBJECTS:</b>	<b>EVALUATION CRITERIA: SUBJECT AREA 1 EMERGENCY EQUIPMENT TRAINING</b>			
	<b>ADEQUACY OF ELEMENTS/ EVENTS</b>	<b>ADEQUACY OF COURSEWARE</b>	<b>TRAINING AIDS AND FACILITIES</b>	<b>REMARKS</b>
Ditching Equipment				
Ground Evacuation Equipment				
First Aid Equipment				
Portable Oxygen Systems				
Firefighting Equipment				
Emergency Exits				
Additional Emergency Equipment				

<b>TRAINING SUBJECTS</b>	<b>EVALUATION CRITERIA: SUBJECT AREA 2 EMERGENCY SITUATION TRAINING</b>			
	<b>ADEQUACY OF ELEMENTS/ EVENTS</b>	<b>ADEQUACY OF COURSEWARE</b>	<b>TRAINING AIDS AND FACILITIES</b>	<b>REMARKS</b>
Decompression				
Fires				
Ditching				
Ground Evacuation				
Unwarranted Evacuation Illness or Injury				
Abnormal situation with Passenger or Crewmember				
Hijacking/Bomb Threat				
Turbulence				
Other Unusual situations				

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TRAINING SUBJECTS	EVALUATION CRITERIA: SUBJECT AREA 3 <i>EMERGENCY DRILL TRAINING</i>			
	ADEQUACY OF ELEMENTS/ EVENTS	ADEQUACY OF COURSEWARE	TRAINING AIDS AND FACILITIES	REMARKS
<b>ONE-TIME DRILLS:</b> Initial New-Hire Training				
PBE/Fire fighting				
Emergency Evacuation				
<b>PERFORMANCE DRILLS:</b> Initial New-Hire and Initial Equipment Training; One Every 24 Months During Recurrent Training				
Emergency Exits				
Hand-Held Fire Extinguishers				
Emergency Oxygen System				
Flotation Devices				
Ditching				
<b>OBSERVATION DRILLS:</b> Initial New-Hire and Initial Equipment Training; Once Every 24 Months During Recurrent Training				
Life raft Removal and Inflation				
Slide raft Transfer				
Slide raft Deployment, Inflation, and Detachment				
Emergency Evacuation/Slide				

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#### **CHAPTER 23. CABIN CREW MEMBER TRAINING AND QUALIFICATION**

##### **Section 5. Cabin Crew Member Aircraft Ground Training Curriculum Segments**

**4.23.5.1. GENERAL.** This section specifies the objectives of a cabin crew member (CCM) aircraft ground training curriculum segment and discusses the structure and content of aircraft ground training. Two distinct subject areas of aircraft ground training are identified: general operational subjects and aircraft specific emergency training. These subject areas must contain training to satisfy the requirements of General Authority of Civil Aviation Regulation (GACAR) Part 121.

**A. Objective.** The objective of aircraft ground training is to provide CCMs with an understanding of the basic aircraft to which the CCM will be assigned. This knowledge is necessary for the CCM to perform required duties and procedures in routine, abnormal, and emergency situations. Aircraft ground training, as used in this section, is training for a specific aircraft. An operator may use many methods when conducting aircraft ground training, including classroom instruction, ground training devices, computer based instruction (CBI), and static aircraft.

**B. Scope and Content.** The scope and content of the training module events and elements presented in this section are examples for guidance and may be particularly useful for a new operator undergoing certification by the General Authority of Civil Aviation (GACA). Although the modular content provided in these examples exceeds the GACAR regulatory requirements, the GACA considers it appropriate to follow these recommendations in order to exemplify a good operating practice; however, the aviation safety inspector (Inspector) should not require existing operators who are functioning under currently approved training programs to change their training solely to accommodate the examples presented in this chapter.

**4.23.5.3. AIRCRAFT GROUND TRAINING CURRICULUM SEGMENT.** The outline for an aircraft ground training curriculum segment should include training that is appropriate to the operator's type of operation. The operator should outline the training in two distinct subject areas of aircraft ground training: general operational subjects training, and aircraft specific emergency subjects training.

**A. Module Outline.** Modules are outlined under each subject area. The outline should provide a

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descriptive title of the module and list the related elements or events presented during instruction. The modules, elements, and events listed under the subject area should contain enough detail to ensure that they provide GACAR required training.

**B. Level of Detail.** Operators do not have to include detailed descriptions of each element or event within a training module outline. Detailed descriptions are more appropriate when included in the operator's courseware. During the approval process, the Inspector should review courseware as necessary to ensure that the scope and depth of the training modules are adequate.

**C. Operator's Flexibility.** An operator has a certain amount of flexibility in the construction of the aircraft ground training modules, as follows:

1) *Training Hours.* The number of training hours must be specified on all aircraft ground training curriculum segment outlines. Inspectors must thoroughly study the operator's proposals. On the basis of experience with the operator, past experiences with other operators, as well as their own training experiences, Inspectors must use reasonable judgment when determining whether the operator can adequately accomplish training within the training hours specified in the curriculum segment. These training hours usually include periods, during instruction, for reasonable breaks.

2) *Sequence of Training.* The operator can determine the sequence of the actual training and may choose to put a training module in more than one curriculum segment; however, the operator should place that training module in the curriculum segment designated in this handbook. For example, GACAR §121.891 requires that an electrical galley equipment training module be placed in the aircraft ground training curriculum segment. At the operator's discretion, however, the electrical galley equipment training module could also be covered in the aircraft general emergency training curriculum segment in conjunction with the firefighting training module.

**D. Curriculum Segment Example.** The following example illustrates a curriculum segment and one of many acceptable methods for presenting a module outline:

- 1) CCM Aircraft Ground Training Curriculum Training Segment Title of Curriculum Segment
  - a) Training Objective: Statement of Training Objectives
  - b) General Operational Subjects: Title of Subject Area

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- Aircraft Familiarization
- Aircraft Equipment and Furnishings
- Aircraft Systems
- Aircraft Exits
- Crew Member Communication and Coordination
- Routine Crew Member Duties and Procedures
- Passenger Handling Responsibilities
- Training modules within a Curriculum Segment Applicable to a Specific Aircraft in the General Subject Area

c) Elements within a Training Module

- Aircraft Familiarization
- Aircraft Description
- Flightdeck Configuration
- Cabin Configuration
- Galleys
- Lavatories
- Stowage Areas

**4.23.5.5. GENERAL OPERATIONAL SUBJECTS TRAINING MODULES.** Modules in general operational subjects training consist of instruction in the general description of the aircraft, aircraft equipment, furnishings, and systems; routine crew member communication and coordination procedures; routine crew member duties and procedures as applicable to specific aircraft during each

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phase of flight; and passenger handling responsibilities that are specific to the aircraft the crew member is qualifying for in the operator's fleet.

**A. Minimum Training Requirements.** General operational subjects training must include training in at least the following:

- The authority of the pilot in command (PIC)
- Passenger handling, including the procedures to be followed in the case of deranged persons or other persons whose conduct might jeopardize safety
- A general description of the aircraft, emphasizing physical characteristics that may have a bearing on ditching, evacuation, inflight emergency procedures, and other related duties
- The use of the public address (PA) system to communicate with passengers, and the means of communicating with other flight crew members, including emergency means in the case of attempted hijacking or other unusual situations
- The proper use of electrical galley equipment, the cabin environmental equipment (heat and ventilation), and the cabin electric circuit breakers

**B. Additional Information.** Training modules for general operational subjects may also include information on operational requirements that are specific to the aircraft in which the training is being conducted. This information may include CCM assigned duties and procedures, crewmember coordination, and crewmember communication responsibilities during each phase of flight.

**C. Training Module Content.** The following are examples of training modules for the general operational subject area. These examples of training modules encompass different types of operations that may not be applicable to an operator's specific type of operation. There are elements and events contained in these training modules that are not specified in the GACAR but are intended to provide Inspectors with further examples of material that may be included in training modules. These examples do not indicate the sole acceptable method, sequence of instructional delivery, subject titles, or amount of detail.

### 1) *Aircraft Familiarization.*

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a) *Aircraft Characteristics and Description:* Description of aircraft make, model, type, and series, including the following:

- Design
- Principal dimensions
- Interior configuration
- Powerplant
- Range
- Speed
- Altitude

b) *Flightdeck Configuration:* Description and location of the following:

- Flight crew member and observer stations
- Portable emergency equipment
- Stowage areas
- Operation of cockpit door including emergency opening

c) *Cabin Configuration:* Description and location of the following:

- CCM station(s)
- Passenger seating zone and aisle
- Passenger seats
- Galley
- Lavatory

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- Stowage areas
- Emergency exits
- Oxygen mask compartments
- Passenger service units
- Passenger convenience panels
- Passenger information signs
- Required placards
- Passenger cargo configurations (combi aircraft)

d) *Galleys*: Description, location, function, and operation of galley equipment, such as the following:

- Ovens
- Refrigeration units
- Stowage compartments and latching devices
- Carts and braking mechanisms and restraining devices
- Electrical control panels and circuit breakers
- Water system and water shutoff valves
- Oxygen mask compartments
- Lower lobe galleys including operation of escape exits and lifts

e) *Lavatories*: Description and location of equipment, such as the following:

- Washbasins

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- Stowage compartments and latching devices
- Oxygen mask compartments
- Passenger information signs
- Required placards
- Automatic fire extinguishers
- Smoke detectors
- Water shutoff valves
- Water heater switches and indicators
- Interior door locking mechanism and signs
- Exterior door locking and unlocking mechanisms

f) *Stowage Areas*: Description, location, and function of stowage areas, such as the following:

- Overhead bins and racks
- Coat closets
- Stowage compartments
- Mass restrictions
- Restraint or latching requirements
- Required placards

### 2) Aircraft Equipment and Furnishings.

#### a) CCM Stations:

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1. Procedures for preflight checks of a CCM jump seat, such as the following:

- Automatic seat retraction
- Jump seat headrest
- Restraint system integrity

2. Description of the function and operation of restraint system

3. Securing restraint system when not in use.

b) *CCM Panels:*

1. Identification of and function of controls, switches, and indicators on CCM panels.

2. Preflight and use of controls and switches.

c) *Passenger Seats:* Description of passenger seats and surrounding area, such as the following:

- Seat belts
- Armrests, footrests, and seat recline controls
- Tray tables
- Passenger service units
- Passenger convenience panels on armrests (as applicable)
- Passenger information signs
- Placards
- Passenger entertainment and convenience systems

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d) *Passenger Service Units and Convenience Panels:* Description of function and use of the following:

- Controls on passenger service units, such as reading lights and reading light switches
- Gasper air outlets
- CCM call light indicator and CCM call light switch
- NO SMOKING and FASTEN SEAT BELT signs
- Emergency oxygen outlets

e) *Passenger Information signs:* Description of location, purpose, and chime indicator of the following passenger information signs:

- NO SMOKING signs
- FASTEN SEAT BELT signs
- LAVATORY OCCUPIED signs
- RETURN TO SEAT signs in the lavatory
- EXIT signs

f) *Aircraft Markings:* Include description, location, and purpose of aircraft markings such as the following:

- Interior emergency exit markings indicating location of each passenger emergency exit
- Emergency exit operating handle markings indicating location of operating handle and instructions for opening exit
- Emergency equipment markings identifying equipment

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- Emergency equipment compartment or container markings identifying contents

g) *Aircraft Placards*: Description, location, and purpose of aircraft placards, such as the following:

- Placards on each forward bulkhead and passenger seat back stating FASTEN SEAT BELT WHILE SEATED
- Placards in each lavatory stating NO SMOKING IN THE LAVATORY

h) *Bassinets and Bayonet Tables*: Description of, and use of, bassinets and bayonet tables including the following:

- Means of securing while in use
- Proper stowage when not in use
- Applicable restrictions

3) *Aircraft Systems*.

a) *Conditioning and Pressurization System*: Description, location, function and operation of temperature controls, such as the following:

- Gasper air outlets
- Cabin pressurization indicators
- Location and function of decompression vents.

b) *Aircraft Communication Systems*. Description, location, function, and operation of the following:

- Manual system controls
- Cabin intercommunication data systems

c) *Communications—Call System* Description, location, function, and operation of the

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call system, such as the following:

- Call light switches
- Chime and light indicators when call is initiated
- Routine and emergency call light identification
- Resetting procedures for call light indicators

d) *Communications—Interphone System* Description of interphone system, such as the following:

- Location of handset controls and indicators
- Function and operation of routine and emergency controls and indicators
- Interphone system inoperative procedures

e) *Communications—Passenger Address System* Description, function, and operation of passenger address system, including the following:

- Location of handset and microphone controls and indicators
- Passenger address system inoperative procedures

f) *Lighting and Electrical Systems:*

- 1) Description and location of interior and exterior lighting.
- 2) Function and operation of cabin lighting systems including the following:
  - Controls
  - Switches
  - Testing procedures

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3) Description and location of circuit breakers, including the following:

- Means of access
- Switches
- Indicators
- Resetting procedures

g) *Oxygen—Flight Crew and Observer Oxygen System* Description and function of flight crew and observer oxygen system, including the following:

- Location of oxygen regulators and quick donning oxygen masks
- Operation of oxygen regulator switches and indicators
- Distinction between “on demand” and “under pressure” oxygen flow
- Proper use of oxygen masks

1) *Oxygen—Passenger Oxygen System*. Including the following:

- Description and location of each type of oxygen mask and compartment
- Location of extra masks
- Description and location of oxygen mask compartment door latching indicators
- Instruction on manual opening of each type of oxygen mask compartment
- Restrictions for repacking oxygen mask compartments

2) Function of passenger oxygen system, including the following:

- Automatic and manual means of system activation

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- Indicators of oxygen system activation
- Procedure for initiating oxygen flow to mask
- Procedure for properly donning oxygen mask and testing for oxygen flow
- Procedure for resetting oxygen system in the event oxygen system is not designed to shut off automatically
- Procedure for activating aircraft system for first aid oxygen

h) *Water System:* Description of aircraft potable water system, such as the following:

- Location of quantity indicators
- Water supply preflight procedures
- Location and operation of individual or main water shutoff valves

i) *Entertainment and Convenience Systems:*

- Description of aircraft entertainment and convenience system(s).
- Location and operation of controls and switches including system indicators.

4) *Aircraft Exits.*

a) *General Information:* Description, location, and identification of each type of cabin and cockpit exit, including the following:

- Type and number
- Function
- Dimensions

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- Basic components

- Controls

b) *Exits with Slides or Slide Rafts—Preflight*

1. Identification and function of door opening controls and indicators.
2. Procedures to preflight door seals
3. Integrity and condition of the following:

- Girt bar and brackets
- Slide or slide raft connections and pressure indicators
- Slide or slide raft engaging and disengaging mechanisms
- Accessible tail cone emergency access handle (as applicable)
- Exit markings and placards
- signs
- Lights
- Assist handles

c) *Exits With Slides or Slide Rafts—Normal Operation*

1. Procedures for opening exit in normal mode, including the following:
  - Disarming door either manually or automatically
  - Verifying girt bar disengagement
  - Assuming correct body position for door opening

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- Operating door controls correctly
  - Securing exit in open and locked position
  - Securing safety strap (if applicable)
2. Procedures for closing exit in normal mode, including the following:
- Removing safety strap (if applicable)
  - Releasing door latching mechanism
  - Assuming correct body position for door closing
  - Using door controls correctly
  - Securing exit in closed and locked position

d) *Exits without Slides—Preflight*

1. Identification and function of door opening controls and indicators.
2. Procedures to preflight the following:
  - Door seals
  - Airstair system (as applicable)
  - Exit markings and placards
  - signs
  - Lights
  - Assist handles

e) *Exits Without Slides—Normal Operation*

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1. Procedures for opening exit, including the following:

- Assuming correct body position for door opening
- Operating door controls correctly
- Securing exit in open and locked position
- Securing safety strap and using airstair system to lower stairs, as applicable

2. Procedures for closing exit, including the following:

- Removing safety strap and using airstair system to raise stairs (as applicable)
- Releasing door latching mechanism
- Assuming correct body position for door closing
- Using door controls correctly
- Securing exit in closed and locked position

f) *Window Exits—Preflight*

1. Identification and function of window opening controls and indicators.

2. Procedures to preflight the following:

- Window seals
- Markings
- Placards
- signs
- Lights

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- Tactile indicators for non-visual conditions

5) *Crew Member Communication and Coordination.*

a) *Captain's Authority*: Description of the captain's authority on aircraft in routine and emergency conditions, including the chain of command as applicable to specific aircraft.

b) *Routine Communication signals and Procedures*: Review of location, function, and operation of communication systems as applicable to specific aircraft, including specific procedures for cockpit and cabin chime and interphone signals for routine situations.

The following are examples:

- CCM notification to be seated prior to movement on the surface
- CCM notification of critical phases of flight
- Flight crew member notification when requesting access to cockpit

c) *Crew Member Briefing*: Review the following:

- Importance of crew briefing and development of crew member resource management concept (CRM)
- Description of crew member responsibilities for crew briefing including any required paperwork
- Content of crew briefing as applicable to specific aircraft

6) *Routine Crew Member Duties and Procedures.*

a) *Crewmember General Responsibilities*:

- Crew member communication and coordination while performing crew member assignments, duties, and procedures as applicable to specific aircraft during each phase of flight
- Description of all operator policies and GACAR pertinent to crew member performance of assigned duties on specific aircraft

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b) *Reporting Duties and Procedures for Specific Aircraft:*

1. Identification of required crew members when specific aircraft is parked at the gate.
2. Description of preflight and in flight duty assignments and responsibilities.
3. Description of passenger boarding procedures.
4. Description of carry-on baggage stowage procedures.
5. Assurance of exit seat program compliance.
6. Conduct of cockpit and cabin crew briefings.
7. Assurance of the possession of all required personal equipment, such as the following:
  - CCM manuals
  - Flashlights
  - Cockpit keys (if applicable)

c) *Pre departure Duties and Procedures Prior to Passenger Boarding:*

1. Description of preflight safety check assignments and procedures.
2. Review of preflight responsibilities as applicable to specific aircraft. The following are examples:
  - Checking jump seat restraint system, retraction, and emergency oxygen source
  - Locating and inspecting all assigned emergency equipment including switches and controls

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- Locating and ensuring that safety information and exit seating cards are applicable to make, model, type, and series of aircraft
- Preparing demo equipment and safety briefing information videotape
- Ensuring that cockpit keys are secured per company policy

d) *Passenger Boarding Duties and Procedures:* Ensure adherence to all regulatory and company requirements as applicable to specific aircraft. The following are examples:

- Ensuring that a minimum number of required CCMs are at the assigned boarding station
- Implementing security procedures
- Monitoring passenger boarding and seating
- Making required announcements
- Assessing passengers to identify possible helpers
- Identifying and handling any unruly passengers
- Screening carry-on baggage
- Screening exit seat occupants
- Ensuring that infant and child restraint devices are approved for use on aircraft and secured properly
- Conducting an individual briefing of any person who may need the assistance of another person to move expeditiously to an exit in the event of an emergency

e) *Prior to Movement on the Surface Duties and Procedures:*

1. Checking for stowaways.

2. Verifying the following:

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- That exit seat and carry-on baggage requirements as applicable to specific aircraft are met
- That all stowage compartments are secured properly
- That no carry-on baggage, cargo, or trash is in unauthorized receptacles
- That galley and service equipment is stowed and secured
- That galley doors, curtains, and dividers are secured open
- That galleys and lavatories are unoccupied
- The proper operation of the doors and airstairs including latching and arming prior to movement on the surface

f) *Prior to Takeoff Duties and Procedures:* Description of prior to takeoff duties and procedures as applicable to specific aircraft. The following are examples:

1. Taking demo positions.
2. Making required safety briefing announcement and demonstration or safety briefing videotape.
3. Individually briefing passengers in seats with restricted view of CCM demonstration or screen.
4. Making passenger and cabin safety inspection to verify the following:
  - No smoking
  - Seat belts fastened
  - Infants held properly or secured in approved infant seat
  - Seatbacks and tray tables in fully upright position

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- All carry-on baggage, including infant restraint devices, properly secured

5. Coordinating with cockpit regarding the security of the cabin for takeoff.

g) *In Flight Duties and Procedures:* Description of performance of routine in flight assignments, duties, and procedures as applicable to specific aircraft. The following are examples:

- Following sterile cockpit procedures
- Stowing the restraint system upon leaving CCM seat
- Implementing appropriate procedures for the handling of any emergency or abnormal situations including turbulence
- Restraining each item of galley equipment and each serving cart when not in use
- Implementing safe lift and lower lobe galley procedures

h) *Prior to Landing Duties and Procedures:* Description of duties and procedures as applicable to specific aircraft. The following are examples:

1. Reporting cabin discrepancies to cockpit.
2. Following sterile cockpit procedures except for safety related communication.
3. Making passenger and cabin safety inspection to verify the following:
  - No smoking
  - Seat belts fastened
  - Infants held properly or secured in approved infant restraint devices
  - Seatbacks and tray tables in fully upright position
  - All carry-on baggage including infant restraint devices and loose objects stowed and secured properly

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- All stowage compartments secured properly
- No carry-on baggage, cargo, or trash in unauthorized receptacles

4. Stowing and securing galley and service equipment.
5. Securing galley doors, curtains, and dividers in open position, lifts in down position.

i) *Movement on the Surface and Arrival Duties and Procedures:* Description of movement on the surface and arrival duties and responsibilities as applicable to specific aircraft. The following are examples:

- The use of the PA to inform passengers to remain seated with seat belt fastened until arrival at gate
- Disarming the girt bar manually or automatically after jetway or stairs are positioned at aircraft
- Verifying girt bar disengagement
- Opening doors and airstairs
- Verifying doors and airstairs opened properly and securely latched

j) *After Arrival Duties and Procedures:*

1. Ensuring minimum number of required CCMs at assigned arrival station.
2. Reviewing deplaning responsibilities as applicable to specific aircraft. The following are examples:
  - Implementing security procedures
  - Ensuring that CCMs are uniformly distributed throughout cabin in accordance with the GACAR and company policy

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- Monitoring passenger deplaning to ensure adherence to all regulatory and company requirements
- Ensuring that all cabin electrical equipment is turned off
- Inspecting unique areas of the cabin and galley to ensure safety precautions specific to that aircraft

k) *Intermediate Stops:* Determining minimum number of CCMs required to remain on board at intermediate stops when passengers remain on board the aircraft

- Ensuring that CCM's are positioned at designated stations
- Implementing procedures to ensure passenger safety during fueling and defueling including procedures for emergency evacuation while parked at gate or ramp

### 7) *Passenger Handling Responsibilities.*

a) *Crew Member General Responsibilities:* Description of crew member duties and procedures for the handling of passengers applicable to the specific type of aircraft and operation.

b) *Infants, Children, and Unaccompanied Minors:* Specific procedures as applicable to specific aircraft. The following are examples:

- Designation of seating locations
- Designation of additional oxygen masks and infant and child life vest locations
- Designation of infant and child carrier and bassinet seat locations
- Description of reporting requirements

c) *Passengers Needing Special Assistance:* Procedures as applicable to specific aircraft such as the following:

- Procedures for the handling of onboard wheelchairs and special aircraft accommodations, such as accessible lavatories and moveable armrests

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- Procedures for the carriage of stretchers and incubators
- Method and procedures for the carriage of a passenger requiring oxygen for personal use
- Description of recommended alternate locations for administering medical assistance
- Description of escape paths and methods for the evacuation of passengers with physical limitations

d) *Passengers Needing Special Accommodation:* Procedures as applicable to specific aircraft for the following:

- Armed passengers
- Escorts
- Prisoners
- Couriers
- VIPs
- Deportees
- Runaways
- Persons traveling without visas
- Other designated unescorted individuals

e) *Carry-On Stowage Requirements:* Procedures as applicable for specific aircraft, such as the following:

- Location requirements for oversized items in the cabin

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- Designated areas for the carriage of pets and pet containers
- Designated areas for the stowage of passenger assistance aids, such as wheelchairs, canes, and crutches

f) *Passenger Seating Requirements:* Procedures as applicable to specific aircraft, such as the following:

- Location of exit seats
- Location of seats for accommodating passengers who are unable to sit erect for a medical reason
- Designated areas for passengers with trained assist animals

g) *Smoking and No Smoking Requirements:* Procedures as applicable to specific aircraft, such as the location of no smoking areas and smoking areas, as applicable.

**4.23.5.7. ADAPTATION OF CABIN CREW MEMBER AIRCRAFT GROUND TRAINING CURRICULUM SEGMENT TO THE VARIOUS CATEGORIES OF TRAINING.** The CCM Aircraft Ground Training curriculum segment is required for the following categories of training: initial new hire, transition, recurrent and requalification. Differences training for all variations of a particular type aircraft may be included in the CCM Aircraft Ground Training curriculum segment for initial, transition, and recurrent training for the aircraft. Differences' training is required when the GACA finds that the variant make, model, or series aircraft varies so much that training on the differences is necessary. An example of this could be when the cabin doors on different aircrafts operate in the same manner but are located in significantly different places on the aircraft. The appropriate differences training would emphasize this variance in location. When differences' training is required, the programmed hours should be specified.

**4.23.5.9. CURRICULUM SEGMENT COMPLETION REQUIREMENTS.** Completion of the CCM Aircraft Ground Training Curriculum Segment must be certified by an instructor or supervisor indicating that the trainee has successfully completed the course. This certification is usually based on the satisfactory evaluation of a trainee's performance. With some training methods, such as CBI, the certification may be based on the trainee's progress checks, which are administered during the course.

### 4.23.5.11. EVALUATION OF TRAINING HOURS.

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A. GACAR § 121.891 specifies 8 programmed hours of instruction for initial aircraft ground training for turbopropeller-powered airplanes and rotorcraft and 16 programmed hours of instruction for initial aircraft ground training for turbojet-powered airplanes. When approving the CCM Aircraft Ground Training Curriculum Segment, the Inspector should consider the following:

- 1) The complexity of the type of operation to be conducted and the complexity of the aircraft to be used should be reviewed.
- 2) Training for a complex type of operation may require that the published training hours be exceeded, while there may be an acceptable reduction in training hours for a less complex type of operation.
- 3) Training modules with corresponding elements and events that have been satisfactorily completed in previous aircraft training may not need to be repeated.

### **4.23.5.13. EVALUATION OF CABIN CREW MEMBER AIRCRAFT GROUND TRAINING**

**CURRICULUM SEGMENT OUTLINE FOR INITIAL APPROVAL.** When evaluating an Aircraft Ground Training Curriculum Segment Outline for initial approval, Inspectors should determine whether the training modules contain the information required for CCMs to perform all routine and emergency duties and procedures for a specific aircraft without supervision. Inspectors should use Figure 4.23.2.1, CCM Training Job Aid, found in Section 2 of this chapter as a guideline when evaluating the proposed curriculum segment outline.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 23. CABIN CREW MEMBER TRAINING AND QUALIFICATION**

##### **Section 6. Cabin Safety Concerns**

**4.23.6.1. FIRE PREVENTION.** This section addresses the need for operators to review their approved training programs and cabin crew member manuals to ensure that the procedures used properly address the concerns expressed in this section.

**A.** Crew member emergency training requires operators to give instruction in the handling of emergency situations, which include potential fire problems related to electrical equipment and circuit breakers.

- 1) On some aircraft, electrical equipment and related circuit breakers are located in cabin areas including all galleys, service centers, lifts, lavatories, and movie/video centers.
- 2) Training on the location, function, and related safety procedures for electrical equipment and circuit breakers should focus on eliminating a problem before it becomes a safety hazard.

**B.** Some reported inflight fire incidents involved the storage of paper products, napkins, plastic or Styrofoam cups, plastic stir sticks, or manuals in galley ovens. In addition, other incidents have been reported involving an aerosol can and a heated can of soup exploding which injured crewmembers. Using galley ovens for anything other than designated purposes poses a potential safety hazard.

- 1) Paper, plastic, or cloth products stored in ovens may easily ignite and are difficult to extinguish. Galley ovens used in this manner have been turned on, causing a fire with dense smoke.
- 2) Many types of plastic or Styrofoam cups and glasses are virtually fireproof. However, some are easily ignited and difficult to extinguish. since many operators serve beverages in throwaway plastic or Styrofoam cups and glasses, inflight fire hazards can be reduced by discouraging use of the highly flammable types.
- 3) Only food that is heated can be stored in ovens. To prevent fires, do not store galley equipment or any other items in ovens. Check ovens and remove any paper products, dry ice,

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or other materials before heating. Ensure ovens are off for taxi, takeoff, and landing. Turn off ovens before opening oven doors.

**C.** The use of galley ovens as heaters has been reported and one incident resulted in a wide body aircraft diversion due to a flight deck indication of a lower lobe galley fire. Post landing inspection by maintenance personnel revealed no evidence of a fire and no malfunction of the smoke detection system. Further investigation indicated that all ovens were on and that the oven doors were open in an attempt to heat the lower lobe galley area. Some food particles that had been left in one of the ovens started to smoke and activated the alarm in the flight deck. In addition to the unnecessary diversion, schedule disruption and consequent public inconvenience, the open oven doors and exposed hot ovens presented unnecessary safety hazards.

**D.** People dropping smoking materials into lavatory waste containers have caused a number of inflight fires and smoke detector activations. The Saudi Arabian Civil Aviation Law prohibits smoking aboard aircraft. Some of the provisions of these rules are as follows:

- 1) Smoking is prohibited in any aircraft lavatory at all times.
- 2) Aircraft lavatories must have placards which notify passengers that it is prohibited to tamper with smoke detectors.
- 3) The required passenger briefing must include detailed instructions on smoking bans.
- 4) Operators should have procedures in their crew member manuals and training programs to ensure that all crew members are aware of the requirements and of what actions to take regarding the smoking ban regulations.
- 5) Operators should have procedures in their crew member manuals and training programs to ensure the trash bin flapper door and waste bin access door is securely closed. Aircraft cleaners sometimes do not close the access door tightly after they empty the trash bin. If the access door is not closed tightly and a trash bin fire was to ignite, air could feed into the trash bin, lessening the effectiveness of the fire extinguisher in the waste bin. If the access door will not close, it must be properly recorded in the maintenance discrepancies for corrective action.

**E.** An operator's cabin crew members must receive practical training in firefighting techniques

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and the operator's manuals should contain adequate procedures for these subjects.

**4.23.6.3. CABIN FLUORESCENT LIGHT BALLAST FIRES.** A landing in excess of the maximum permissible landing mass of a wide body aircraft fueled for a trans-Pacific flight was narrowly averted following successful handling of a cabin fluorescent light ballast fire which occurred immediately after lift-off.

**A.** An interview of the crew indicated that none had ever heard of a fluorescent light ballast fire and, thus, were totally unfamiliar with its relatively nonhazardous characteristics. This lack of knowledge nearly caused a greater emergency, which could have progressed to a disaster of unknown proportions because the captain was placed in a situation that required a decision to make an emergency return and landing, in spite of the inability to dump fuel and thus reduce mass much below the maximum authorized for landing.

**B.** Ballast fires, though spectacular, are understood to be brief and for all practical purposes self-extinguishing. While new ballasts all but eliminate the problem, it is unlikely that older aircraft will be retrofitted in view of the considerable expense involved. Since these conditions may therefore be expected to exist for some time, and since such incidents may become more numerous commensurate with aging of the aircraft fleet, Inspectors should take the following steps:

- 1) Recommend that ground training and/or safety bulletins be initiated to inform flight deck crews and cabin crew members of the causes, characteristics, and degree of hazard associated with fluorescent light ballast fires.
- 2) Recommend that aircraft mass and balance data available to the flight crew be sufficient to provide accurate approach and landing speeds following immediate turn back when an excess mass landing is necessary.

### **4.23.6.5. PROCEDURES AND TRAINING FOR EMERGENCY EVACUATIONS.**

**A.** There have been several instances where the emergency slide girt bar attachment was hindered due to mechanical interferences. Girt bar attachment points can accumulate ice or obstructions such as plastic forks, pencils, etc.

**B.** These instances indicate a possible deficiency in cabin crew member training which should be remedied by renewed emphasis in certain areas. Operator's training programs should ensure that:

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- 1) Cabin crew members are fully aware that manual inflation of escape slides should be attempted if auto deployment fails.
- 2) Prior to closing any door, girt bar attachments are inspected to ensure that they are free from ice or other obstructions which might interfere with engagement of the automatic slide deployment feature.

**4.23.6.7. TRAINING ON CONDITIONS OF AIRCRAFT FOLLOWING AN ACCIDENT.** In some accident investigations, the United States (US), National Transportation Safety Board (NTSB) has found that although cabin crew members provided valuable assistance to passengers during emergency situations, they did not always follow their air carrier's approved emergency procedures or perform their duties in accordance with training. The NTSB reviewed its investigations of accidents and incidents where information was available on cabin crew member performance during emergency situations.

**A.** As the result of accident interviews with cabin crew members, the US NTSB concluded that cabin crew member training courses need to emphasize the conditions of the aircraft following an impact. While most cabin crew member training curriculums contain information about this subject, the GACA believes that training should emphasize the following post-crash topics:

- Fire
- Debris
- Toxic fumes
- Low probability of explosion

**B.** Operators should show cabin crew members visual presentations of aircraft cabins following a crash. They should emphasize the possibility of cabin floor and aircraft fuselage distortions and breaks. For example, in one accident, part of the cabin was upside down while another fuselage section was relatively level. The level fuselage section's floor had a large break. In addition, debris in the form of carry-on baggage, galley supplies, and other items may dislodge and clutter the aisles. Survivors of accidents have reported climbing over debris and standing on "something" in order to climb out the top of the fuselage.

**C.** Training courses should also address the presence of fire and toxic fumes during and following

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a crash. Training curriculum should address fire dynamics, including flash overs, other heat patterns associated with super-heated air, and the probability of explosion. There is also the problem of toxic fumes. Research and accident histories indicate that when toxic fumes and/or smoke are present, the “quality air” is about arm rest level. Most air carriers use a diminished light environment coupled with simulated smoke when conducting evacuation drills, which is a good method for bringing crew members’ attention to the crash environment. This is especially true when it is followed by a discussion of accidents and incidents.

**D.** Additional post-crash topics should include passenger management procedures immediately following an accident, such as gathering passengers together upwind of smoke/fire out of the path of emergency vehicles approaching the accident, trying to obtain a passenger count, and initially assessing passenger injuries.

### **4.23.6.9. AVAILABILITY, CAPABILITIES, AND USE OF EMERGENCY FLOTATION**

**EQUIPMENT.** As a result of an accident that involved a Boeing 727 making an unscheduled landing in water during an approach, survivors experienced difficulties with the location and use of emergency flotation equipment during the aircraft evacuation.

**A.** This particular aircraft was equipped with life vests and not flotation type seat cushions. However, some passengers either used or attempted to use the seat cushions for flotation. The passenger briefing cards in use at the time of the accident depicted the location and use of life vests. During the post-crash investigation, two crewmembers stated that they assumed the seat cushions were approved flotation devices.

**B.** Two other crew members were not sure if the seat cushions were approved flotation devices. The survivors experienced numerous difficulties with the location, removal, donning, and inflation of their life vests.

1) Some passengers had difficulty removing the life vest from the fabric pouches beneath the seats.

2) Others had difficulty in unpacking the life vest from the sealed plastic bag.

3) Many had difficulty inflating the life vest. Some life vests recovered after the accident only had one of the two chambers inflated.

**C.** During the post-crash investigation, the US NTSB queried several operators as to the type of

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flotation equipment on their aircrafts. Some operators had aircrafts with only flotation type seat cushions and no life vests. Some had aircrafts with only life vests and no flotation type seat cushions. Others had a mixed fleet with some aircrafts having flotation type seat cushions and some having life vests.

**D.** This accident indicates possible deficiencies in cabin crew member and flight crew member training, programs, and pre-takeoff passenger briefing procedures. Operators should ensure that:

- Flight and cabin crew member initial and recurrent training programs include detailed information regarding the location, function, and operation of the emergency flotation equipment installed in the aircraft each crew member operates
- If an operator has a mixed fleet of aircraft (i.e., some having flotation type seat cushions and some having life vests), flight and cabin crew should be aware of the type of equipment available on each aircraft during operations
- Crew members must brief passengers on the type, location, and use of required flotation equipment. This briefing must include the type of equipment available at the individual passenger's seat and the method of use in the water, such as putting the arms through the straps and resting the torso on the cushion. When the aircraft is equipped with life preservers, the briefing must include instructions about the location and removal of life preservers from stowage areas, including pouches, and the donning and inflation of the life preservers. If the aircraft is equipped with flotation cushions and life preservers, cabin crew members should brief passengers on both types of equipment and must brief passengers on the required flotation equipment.

### **4.23.6.11. TRAINING ON THE CHEMICALLY GENERATED SUPPLEMENTAL OXYGEN SYSTEM.**

In several accident investigations, the US NTSB found that although cabin crew members provided valuable assistance to passengers during emergency situations, they did not always follow their air carrier's approved emergency procedures or perform their duties in accordance with training. The US NTSB reviewed its investigations of accidents and incidents where information was available on cabin crew member performance during emergency situations. The report, titled "Flight Attendant Training and Performance during Emergency situations, NTSB/SIR-92/02 offers some recommendations on this subject. They included a recommendation to update and issue guidance regarding the operational characteristics of chemically generated passenger supplemental oxygen systems.

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**A.** Operators should ensure that crew member training programs and appropriate manuals include detailed information regarding the operational characteristics of the chemically generated passenger supplemental oxygen system. That information should include:

- Canister
- Lanyard/safety pin
- Flow initiation mechanism
- Reservoir bag
- Oxygen mask
- Hose
- Heat shield
- Heat generation
- Oxygen outlets

**B.** Passenger briefings and demonstrations describe the specific oxygen system used on a flight. Briefings should emphasize the location of passenger oxygen (e.g., overhead units, seat backs, and bulk heads), proper placing of mask on the face, use of adjustment straps, and indications of oxygen flow (reservoir bag).

**C.** Printed instructions on the passenger briefing cards for the use of the passenger chemical supplemental oxygen system should be factual and contain sufficient information for proper use. These instructions should include donning techniques, adjustment requirements, and any action necessary to initiate oxygen flow. In addition, instructions should be provided which direct passengers to secure their own masks before assisting others.

### **4.23.6.13. CABIN CREW MEMBER TRAINING ON THE USE OF FLIGHTDECK**

**EMERGENCY EQUIPMENT.** Operator should ensure that cabin crew members are familiar with flightdeck emergency equipment. Information about the location and operation of the following flightdeck emergency equipment should be included in the operator's cabin crew member manuals:

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- Flightdeck door access
- Flightdeck exits
- Emergency supplemental oxygen
- Fire extinguishers
- Crash axes
- Protective breathing equipment (PBE)
- Any other emergency equipment located in the flightdeck
- Operation of flightdeck seats

**A.** During initial and transition training, cabin crew members should receive familiarization training on flightdeck emergency equipment. Operators do not have to require cabin crew members to physically operate the flightdeck emergency equipment. Training in flightdeck emergency equipment may be accomplished through audiovisual presentations, computer based instruction, or other instructional media.

**B.** Operators should include appropriate procedures regarding flightdeck emergency equipment in their manuals and training programs.

### **4.23.6.15. TRAINING IN FIRE CONTROL EQUIPMENT AND RELATED TRAINING DRILLS.**

**DRILLS.** Present regulations require that operator training programs include individual instruction in the location, function, and operation of portable fire extinguishers that emphasizes the type of extinguishers used to fight fires of different classes.

**A.** Operators should provide instruction to crewmembers in the handling of inflight fires, fires that occur on the ground, and smoke control procedures, emphasizing electrical equipment and related circuit breakers.

**B.** The following two drills are associated with fire control.

- 1) *Fire Extinguisher Drill.* A fire extinguisher drill is required every 24 months. During

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this drill, each crew member must operate each type of hand held fire extinguisher installed on the operator's aircraft.

2) *PBE/Firefighting Drill.* A PBE/firefighting drill is a onetime requirement consisting of two exercises. Exercise one requires crew members to operate the PBE while fighting an actual or simulated fire. Exercise two requires crew members to discharge a fire extinguisher and fight an actual fire. The exercises of this PBE/firefighting drill may be combined. When the operator combines the exercises of the PBE/firefighting drill, the crew member discharges a fire extinguisher while fighting an actual fire and while wearing PBE.

**NOTE:** Some operators have elected to use an installed fire extinguisher when accomplishing the PBE/firefighting drill. This could allow the operator to simultaneously meet the requirements of the fire extinguishing drill required for the 24 month period.

**C.** During the fire extinguisher drill required every 24 months, crew members should use each type of fire extinguisher installed on the operator's aircrafts.

1) Aviation Safety inspectors (Inspectors) may approve the use of fire extinguishers that closely simulate the ones installed on the aircraft.

2) Cabin crew members should remove each type of fire extinguisher from its brackets. The brackets should be the same as those on the aircraft.

3) Cabin crew members should demonstrate the proper operation of the fire extinguisher including pulling the trigger. The fire extinguisher does not have to be charged. Nevertheless, it is desirable to have it charged with the appropriate agent or with a material that simulates that agent.

4) Cabin crew members may use any fire extinguisher when they fight an actual fire as long as each crew member performs an additional fire extinguisher drill using a handheld fire extinguisher of the type installed by the air carrier. The purpose of fighting an actual fire is to provide crew members with the opportunity to experience the effects of facing an actual fire. Of course, operators may elect to use an installed fire extinguisher for the actual firefighting drill.

### **D. PBE training should include:**

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- 1) Accurate simulation of PBE installed on the aircraft. Inspectors should ensure that PBE used in training properly simulates the mass, method of donning, method of activation, and appearance of the actual PBE.
- 2) Removing PBE from its stowage area and container/pouch.
- 3) Donning the PBE, activating it, and other actions necessary to use the installed equipment.

### **E. The Nature and Value of Combatting an Actual Fire.**

1) Many people confuse meeting training objectives of fighting an actual fire with the psychological benefits that one can gain through experiencing an actual fire. The psychological effect of facing an actual fire cannot be achieved through simulation. Many experts recommend that live fire training using Hand Fire Extinguishers provides crew members with psychological conditioning, firefighting techniques, and knowledge of extinguishing agent capabilities and limitations under actual fire situations. Experts also recommend firefighting training with an actual fire be reinforced by classroom instruction using manipulative skills training (simulation). The recommended fire simulation scenarios include:

- Galley fires
- Lavatory fires
- Flightdeck fires
- Closed compartment fires, and
- Flammable liquid fires

- 2) An actual fire means an ignited combustible material, in controlled conditions of a sufficient magnitude and duration to accomplish the training objectives set forth in the rule.
- 3) Industry practice shows that operators frequently contact local or airport fire departments. In some cases, fire department personnel are present during training. Many local fire departments provide training course outlines on the use of small, hand held fire

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extinguishers and they also typically provide training on the operation of hand held fire extinguishers to employees of local businesses and organizations. Under fire department supervision, these employees are given the opportunity to extinguish an actual fire.

4) When creating actual fires, fire departments and operators often use, among other materials, kerosene or diesel fuel floating on water in a metal pan or drum. These fires are ignited outdoors in an open area. Some air carriers and fire departments have constructed indoor fire rooms or fire pits in which they ignite materials such as seat cushions and use exhaust fans to eliminate smoke following the firefighting training.

### **F. Simulation.**

1) A simulated fire is an artificial replication of a fire used to create the various firefighting situations that could occur on an aircraft. For example, electric lights that the instructor controls by turning them on and off to show that the crew member has extinguished the fire correctly.

2) Smoke simulation is a component of the fire simulation described in the guidance material. Artificial smoke may be used to simulate smoke coming from a galley oven, under a lavatory door, or under a passenger seat.

**G.** Crew members would not necessarily use PBE every time there is a fire. Crew members should use PBE whenever they determine that dense smoke and/or fumes are present which do not permit effective firefighting at close range or when the fire is of unknown origin. There is some debate about crew members donning PBE when there is a fire on the ground and when an immediate evacuation is conducted. The most important variable in a successful evacuation is speed. If a crewmember is at a door, the need to don PBE may not be great unless the crew member is going back into the cabin. Manuals and training programs should contain procedures indicating the proper use of PBE.

**H.** The GACARs allows credit to be given toward the completion of the PBE drill including fighting an actual fire during an approved training program (this includes performing the firefighting exercise with another operator). This verification is accomplished by obtaining a written copy of official training records. The records should include the information that the crewmember accomplished the PBE/firefighting drill on a given date. This record should be accompanied by a signed copy of that portion of the approved training program that addresses the PBE/firefighting drill. Upon review of this information, Inspectors should be able to verify

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that the crew member has completed all parts of the PBE/firefighting drill, including fighting an actual fire. Unless documents clearly state that the crew member fought an actual fire, the crew member must perform the firefighting drill again.

### **4.23.6.17. PROCEDURES AND TRAINING FOR POTENTIAL DECOMPRESSION EMERGENCIES.**

**A.** Accident investigators, Inspectors, and crew members have reported that cabin crew members failed to know and/or follow recommended procedures during aircraft cabin decompressions. These procedures have been discussed with the industry during certain international cabin safety workshops and are contained in guidance material. With few exceptions, air carriers have adopted the recommended procedures from those workshops.

**B.** The GACA recommended procedures for cabin crew members to follow during a decompression:

- 1) Immediately don the nearest oxygen mask.
- 2) Sit down or grasp a fixed object.
- 3) Hold on in order to brace against possible decompression forces until given clearance to move about the cabin by a flight crew member.

**C.** These recommended cabin crew member actions are based on research, which indicates that physical activity, such as that performed by a cabin crew member, will significantly shorten the time of useful consciousness (TUC) during an aircraft decompression.

**D.** Operators should have these procedures included in the appropriate manuals and incorporated in cabin crew member training programs.

### **4.23.6.19. UNWARRANTED EVACUATIONS.** Reports concerning warranted and unwarranted emergency evacuations reveal that there is a need for improvement in procedures and training.

**A.** Operators should ensure their emergency evacuation procedures and training programs address the following:

- 1) Flight crews and cabin crew members are trained to recognize and act promptly in

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situations requiring an emergency evacuation.

- 2) Cabin crew members are trained to carry out an emergency evacuation on their own initiative in the event that the flight crew is incapacitated or otherwise prevented from participating.
- 3) Cabin crew members are trained to recognize when evacuation equipment is inoperative or faulty, act promptly in preventing the use of such equipment, and quickly divert evacuating passengers to usable exits.
- 4) Flight crew and cabin crew member training emphasizes the ability to recognize the need to terminate an evacuation if conditions change and permit such action. Cabin crew members should be trained to immediately command passengers to stop the (unwarranted) passenger evacuation and immediately notify the flightdeck of the situation. Cabin crew members should be made aware of the urgency to notify the flight deck so that the aircraft may be stopped, shut down the engines, contact the tower (as necessary), etc.
- 5) Emergency alarm signal units, if installed in the cabin, are properly located and guarded to preclude inadvertent activation.

**4.23.6.21. USE OF MOCKUPS IN CREW MEMBER EMERGENCY TRAINING.** Mock ups provide realism during training in emergency situations. Cabin mock ups and cabin door training devices are part of GACA approved training programs for cabin crew members. The Inspector assigned to an operator is responsible for the approval of these training devices. Approval of a training device(s) is concurrent with approval of the entire training program. The device is only one part of any training program.

A. The following provides guidance for approval of training devices:

- 1) Inspectors should review the procedures contained in any training module that incorporates the use of a training device(s). The training device must realistically simulate the exit that it represents.
- 2) Whenever possible, before the on-site inspection of the device, the Inspector should operate the actual aircraft exit represented by the device. By opening the actual door in the normal mode, the Inspector will be able to determine the force needed to operate the device. Additional information regarding the normal forces may be obtained from the aircraft

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manufacturer. The normal forces needed to open any given type of door may have a wide range. In some cases, the range could be as much as 90 Newtons (20 pounds). Inspectors should experience the forces using an actual door to determine what the opening of the door “feels like.” In the case of tailcone devices, the Inspector should perform a walk through in order to become familiar with its dimensions.

**B.** During the on-site inspection of the training device, the Inspector should ensure that the device:

- 1) Accurately represents the position and operation of the handles and hardware of the actual aircraft door.
- 2) Simulates both the normal and emergency modes.
- 3) Incorporates the actions required to operate the exit in the same manner as the actual door in both the normal and emergency modes of operation.
- 4) Requires representative forces to open the door in the emergency mode.
- 5) Is equipped with a manual inflation handle, if applicable. The training program should address the fact that the inflation handle may not always be in the same location on similar aircraft.

**C.** During the on-site inspection and using the operator’s procedures, the Inspector should have a qualified instructor demonstrate the operation of the device in the normal and emergency modes.

**D.** The Inspector should then operate the training device in the normal and emergency modes, using the provided instruction, to determine that the device and the training provide realistic simulation of the corresponding exit.

**E.** The Inspector should ensure that the operator has an established maintenance program for training devices. This program should ensure that each device maintains the appearance, functions, and forces existing during original approval. The approved training program should list by name and title the person responsible for the maintenance of each training device.

**F.** Exit differences should be highlighted in the training program whenever a single training device is used to represent more than one exit. Examples include differences between Type I, Type

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A, and Type III exits or size and appearance among similarly operating exits. Other training aids may include, but are not limited to:

- Aircraft study guides
- Videotape presentations
- Slide presentations
- Aircraft familiarization walk around

**G.** Whenever the motions needed to operate an emergency exit training device are different from those actually required on the aircraft, the training requirements must be met by using another true to life training device or the aircraft itself. The following are examples:

- The different methods of operation for the 2L/2R and 3L/3R doors on the Airbus A321 such as the 4–6 second delay between activation of the opening mechanism and full opening of the aircraft door and the different procedures regarding the use, as well as the actual placement, of the manual inflation handle
- The differences between any aircraft trainer and the actual aircraft with a tailcone exit, such as the Boeing 717, including a tailcone environment that accurately represents the equipment and the environment on the aircraft to ensure that cabin crew members are able to use proper door opening technique, proper use of assist space, and proper methods to manually deploy and activate the emergency slide

### **4.23.6.23. CREW MEMBER SURVIVAL TRAINING.**

**A.** Aircraft accidents illustrate the importance of having crew members trained in survival techniques so that they may be able to assist passengers in surviving severe environmental conditions following an accident. This survival training should include instruction in survival techniques at sea, in desert areas, in mountainous regions, and in winter conditions.

**B.** GACAR Part 121 requires each operator to provide emergency training for its crew members.

- 1) These training requirements include:

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- Training in the operation of emergency equipment
  - The proper use of first aid equipment
  - Instruction in handling illness, injury, or other abnormal situations involving passengers or crew members
- 2) Operators should be informed to add the training appropriate to the climatic conditions and geographic area associated with the operator's route structure not presently in the crew member's training program.

**NOTE:** The training listed need not be repeated if that type of training was previously accomplished during another phase of training. Inspectors should ensure that their assigned operators accomplish survival training, as appropriate, for the areas of operation.

**4.23.6.25. TRAINING, QUALIFICATIONS, AND OPERATIONAL CONTROL OF CABIN CREW MEMBERS WHO HAVE SERVED OR MAY BE SERVING AT MORE THAN ONE OPERATOR.** This paragraph provides information regarding the approval of cabin crew member training programs and other procedures for cabin crew members who have had experience with another operator or are presently employed by another operator.

- A. There are no explicit regulatory provisions for one operator to credit training previously conducted by another operator.
- B. Learning interference is increased when the cabin crew members are assigned to duties on one type of aircraft that is operated differently by two or more operators. Therefore, in some cases, it is possible that cabin crew members experienced with one operator may actually need more training instead of less.
- C. The cabin crew members used by an operator should all complete the same training program. This training program should be sufficient for cabin crew members to be fully qualified to operate on the aircraft for which they are to serve as a cabin crew member in that operator's GACAR Part 121 operation. Additional training may be needed for reasons such as:

- 1) Qualification on another aircraft.
- 2) Qualification to operate in extended overwater operations.

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3) Additional security training.

4) Equipment differences.

**D.** Inspectors should not approve any cabin crew member training programs or reductions in programmed hours to cabin crew member training programs which differ from the cabin crew member training program and programmed hours that are currently used for new hire cabin crew members.

**E.** Operators conducting operations under GACAR Part 121 should have only one approved cabin crew member training program for all cabin crew members who will be used by the operator.

**F.** Inspectors should ensure:

- 1) Operators have one approved training program which all new cabin crew members (regardless of experience level or present state of employment) complete before they serve as crew members in that operator's operations.
- 2) Additional training is provided if the Inspector finds it is necessary for cabin crew members who have experience with another air carrier to receive additional training to satisfy the performance of their assigned duties.

**4.23.6.27. EVACUATION SLIDE DRILL.** This paragraph addresses the application of GACAR 121.907(c)(1)(iii). This regulation requires crew members to perform a one-time emergency evacuation drill with each person egressing the aircraft or approved training device using at least one type of installed emergency evacuation slide. This regulation does not apply to aircrafts which are not equipped with slides. This pertinent sub paragraph (iii) affords crew members experience with evacuation slides on those aircrafts for which evacuation slides are required. Subparagraph (iii) does not apply to those aircrafts for which evacuation slides are not required.

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#### **CHAPTER 24. MAINTENANCE AND PREVENTATIVE MAINTENANCE TRAINING PROGRAM/RECORDS FOR PART 121**

##### **Section 1. Training Program Evaluation**

###### **4.24.1.1. GACA Activity Report (GAR).**

###### **A. GAR 3633 (AW)**

**4.24.1.3. OBJECTIVE.** This section provides guidance for evaluating and approving an operator's maintenance and preventative maintenance training program.

**4.24.1.5. GENERAL.** Effective training is the basis for a successful continuous airworthiness maintenance program (CAMP). Although many procedures for maintaining and inspecting aircraft may be similar, the equipment, procedures, and task documentation used is unique to the operator's specific programs.

**A. Maintenance/Preventative Maintenance/ Inspections.** General Authority of Civil Aviation Regulation (GACAR) Part 121 requires that maintenance/preventative maintenance/inspections be performed in accordance with the operator's maintenance manual.

**B. Maintenance and Preventative Maintenance Training Programs.** Maintenance and preventative maintenance training programs are the most efficient manner to inform personnel of the requirements of the operator's program.

**4.24.1.7. COORDINATION REQUIREMENTS AND SCHEDULING.** General Authority of Civil Aviation (GACA), aviation safety inspectors (Inspectors) should encourage applicants to discuss pending maintenance/inspection training with the certification team (if applicable) before the program is submitted for final approval. It is especially important that programs be reviewed for conformity with applicable regulatory requirements. This review can reduce the number of major changes an operator will have to make after a program has been printed and distributed.

**4.24.1.9. SCHEDULING MAINTENANCE TRAINING PROGRAMS.** Delays in program approval result in delays in the certification process. To facilitate the evaluation of the training programs, the applicant should be encouraged to schedule a classroom training session in a timely

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manner.

### **4.24.1.11. CONTENT OF MAINTENANCE AND PREVENTATIVE MAINTENANCE**

**TRAINING PROGRAMS.** The training program for an operator's Continuous Airworthiness Maintenance Program (CAMP) should include company indoctrination and technical training (formal and on-the-job training (OJT)). The program should contain a list of tasks to be taught and a method for recording the training. Completion of the training must be entered in the individual's training record.

**NOTE:** For additional guidance regarding the CAMP and training programs see: Federal Aviation Administration (FAA), Advisory Circular (AC) 120-16 (as amended) Air Carrier Maintenance Programs, Chapter 10.

**A. Company Indoctrination.** Each maintenance/inspection employee should receive instruction in the use of the operator's manuals, policies, procedures, and forms. The training program should contain a policy statement that emphasizes the importance of following the operator's documented maintenance procedures without deviation. Additionally, the program should include information pertaining to the operator's procedures for identifying errors or deficiencies in maintenance procedures and the actions to be taken to ensure safe, GACA-acceptable practices and airworthy aircraft.

**B. Maintenance/Inspection Technical Training.** Training may consist of a combination of formal (classroom) instruction and On-The-Job Training (OJT). The operator may give training credit to individuals for experience gained while employed by other operators.

- 1) Procedures unique to the operator/ should be taught. Training records should indicate the amount of formal training, OJT, and experience each individual receives.
- 2) Technical training may be contracted to another operator or manufacturer, or in the case of a specialized process, to a person knowledgeable in that specialized process. The operator is responsible for the content and quality of such training.
- 3) The GACA does not establish a fixed amount of time for indoctrination or technical training courses but the courses should use a minimum time proportional to the operator's complexity.

**C. Human Factors Training.** Each maintenance/inspection employee must receive initial and

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recurrent instruction in the subject of human factors. Further information on the human factors training program may be found in Section 2 of this chapter.

**D. Responsibilities for Persons Other than an Operator's Employees .** GACAR Part 121 requires each operator to be primarily responsible for having a training program and to ensure that the training received throughout the operator's system is of uniform quality and effectiveness. This covers all personnel, such as the operator's employees and contract personnel for emergency maintenance and servicing.

- 1) GACAR § 121.695 requires that each operator or person who performs maintenance have a training program. The training program ensures that each person, including inspection personnel, is fully informed about procedures, techniques, new equipment in use and is competent to perform the applicable duties.
- 2) GACAR Part § 121.687(a) is similar in that no person may use any person to perform required inspections unless the person performing the inspections is appropriately certificated, properly trained, qualified, and authorized to do so.

**NOTE:** GACAR Part 1 defines a “person” as an individual, firm, partnership, corporation, company, association, joint-stock association, or governmental entity.

**E. Recurrent Training.** The operator's training program should ensure that any deficiencies discovered through continuous analysis and surveillance is corrected during recurrent training. Additionally, recurrent training should include at least the following:

- Review, reinforcement, and upgrade of all training given in both indoctrination and technical subjects
- Input from maintenance bulletins and/or maintenance newsletters
- Tasks, such as run-up/taxi, Required Inspection Items (RII), and nondestructive inspection (NDI)

**F. Training Records.** Training records must be retained by the operator to document that personnel are adequately trained. Training records should be maintained at a central location, but may be maintained at other locations provided these locations are listed in the operator's manual.

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**G. Special Emphasis Training.** Special maintenance/preventative maintenance/inspection training programs are required when new or different types of aircraft and/or equipment are introduced.

### 4.24.1.13. REFERENCES, FORMS, AND JOB AIDS.

#### A. References:

- GACAR Part 121

#### B. Forms.

- GACA Activity Report (GAR)

#### C. Job Aid. None.

### 4.24.1.15. PROCEDURES.

#### A. Review Operator File.

**B. Review Schedule of Events.** If this task is performed as part of an original certification, review the schedule of events to ensure that this task can be accomplished in accordance with the schedule.

**C. Review Maintenance/Required Inspection Items (RII) Training Programs.** The program should include the following elements in both the maintenance training program and the RII training program.

- 1) The name of the person responsible for the overall administration of the maintenance/RII training program.
- 2) The name(s) of the person(s) responsible for other processes within the maintenance/RII training program (e.g., recordkeeping, revisions to training programs, and security of the program).
- 3) Designated maintenance/RII training instructors.
- 4) A description of how instructors are determined to be qualified.

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- 5) Procedures used to authorize instructors.
- 6) A file on the instructors consisting of qualifications, authorizations, and other documents pertaining to instructor assignments.
- 7) A list describing what type of training is required for new employees or RII candidates (indoctrination, OJT, etc.).
- 8) Procedures for evaluating, crediting, and documenting a new employee's previous training.
- 9) Procedures for determining what additional training is required for a new employee.
- 10) A schedule for recurrent training, a description of recurrent training, and procedures for determining requirements for other training.
- 11) Recordkeeping procedures, including records of the following:
  - Training dates
  - Who performed the training (instructor should indicate by signing)
  - The number of hours of training performed
  - The content of the training performed
- 12) Criteria for determining the quality of the training program (training standards).
- 13) Evaluation of the need to revise training programs.
- 14) A training syllabus that describes the following:
  - Content of each training course
  - Format of training (classroom, OJT)
  - Duration of training courses

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- Standards for grading students
- Training aids

15) Criteria to determine acceptability of contract training, to include:

- Qualifications of instructors
- Criteria to establish appropriateness of reference material being taught
- Reporting procedures to inform the operator of student progress
- Criteria to determine adequacy of facilities
- Criteria to evaluate contractor's training syllabus

**D. Review Required Inspection Items (RII) Training.** The operator must provide RII original and recurrent training, including:

- 1) A statement that RII students are appropriately certificated, qualified, trained, authorized, and current as airframe and/or powerplant mechanics or appropriately certificated repairmen.
- 2) A method for notifying the RII candidate of the successful completion of the course.
- 3) A method for receiving confirmation by the candidate of acceptance of RII authorizations and responsibilities.

**E. Observe Operator Performing Training.** This observation is performed regardless of whether the operator performs the training or contracts with another company.

- 1) Ensure that facilities are adequate, including classrooms, training aids, and reference materials.
- 2) Evaluate the instructor's presentation and knowledge.
- 3) The instructor should have capabilities and experience related to aviation maintenance that a reasonable person would accept as credible. The instructor should have effective communication skills and the ability to convey credibility to the majority of the students or

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course participants. Experience in aviation maintenance is an acceptable course leader's most highly preferred attribute.

- 4) The GACA does not determine instructor qualifications. However, if the GACA, through its surveillance process, finds that the qualifications or skills of an instructor are deficient, the operator must correct any deficiency associated with that instructor and with its instructor selection.
- 5) Ensure that course content and instruction is in accordance with the training syllabus.
- 6) Ensure that training recordkeeping is performed in accordance with the training program.

**F. Analyze Findings.** Evaluate all deficiencies to determine what changes will be required.

### **G. Program Approval or Rejection.**

- 1) The Inspector will review the proposed training program or revision and recommend to the Director of Airworthiness to either approve it or prepare an explanation of why the program or revision is not acceptable as submitted.
- 2) If the GACA does not accept a submittal, the operator should propose revisions that address the GACA's concerns. When the operator has adequately addressed all the concerns expressed in the non-acceptance, the GACA will approve the program via Operations Specification (OpSpec) D72.
- 3) The operator can initiate a change to the approved training program. The operator should provide revisions to the program document to the Inspector for further approval. The training program may change to accommodate modifications to the operator work, and/or its customers, and in response to the ongoing assessment processes of the customer and of the GACA. Correction of typographical errors and changes to phone numbers are examples of changes not requiring GACA approval. However, the operator should send a corrected copy to the GACA for record retention purposes.
- 4) The training program should have a process measurement element that verifies the effectiveness of the training. This provides a continuous improvement characteristic to the training program. Therefore, one of the key areas the GACA will monitor is the feedback process that takes evaluation results and adjusts training needs. The GACA might also

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independently assess training to evaluate the effectiveness, particularly where safety risk is relatively high.

### **4.24.1.17. TASK OUTCOMES.**

**A. Complete GAR.**

**B. Complete the Task.** Successful completion of this task will result in the following:

- 1) Program approval via OpSpecs D72.
- 2) The original approved program sent to the operator.

**C. Document Task.** File all supporting paperwork in the operator's file.

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#### **CHAPTER 24. MAINTENANCE AND PREVENTATIVE MAINTENANCE TRAINING PROGRAM/RECORDS FOR PART 121**

##### **Section 2. Evaluate and Approve a Maintenance Human Factors Training Program**

###### **4.24.2.1 GACA ACTIVITY REPORT (GAR).**

A. 4306 (AW) (Initial)

B. 4307 (AW) (Recurrent)

**4.24.2.3. OBJECTIVE.** This section provides guidance for the evaluation and approval of human factors (HF) training programs for maintenance personnel.

**4.24.2.5. GENERAL.** Effective training is the basis for a successful maintenance and inspection program. Although many procedures for maintaining and inspecting aircraft may be similar, the equipment, procedures, and task documentation vary widely depending on the operator's specific program. Human factors training plays an essential part in identifying those areas and is the most efficient manner of educating maintenance technicians and others of the importance of good human factors principles, practices, and techniques.

###### **4.24.2.7. DISCUSSION.**

A. Human factors issues contribute to approximately 80 percent of all aviation accidents and incidents. Research and experience have shown that human factors training can address many of the issues that contribute to these maintenance events. Attention to maintenance human factors can raise efficiency, effectiveness, and safety in aviation environments. This translates to better expense control and long-term safety benefits.

B. Maintenance human factors training is part of a total system in managing human error designed to discourage procedural violations. It is an essential part of a system aimed at individuals engaged in hands-on maintenance, and those who supervise and plan maintenance activity. Human factors training should cover basic safety principles and practices integrated within a maintenance organization's program.

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**C.** The objective of human factors training is to provide principles and techniques that will help operators do a better job by:

- Improving safety
- Decreasing organizational exposure to risk
- Reducing and capturing errors
- Encouraging employees to report safety issues and concerns without fear of retribution

**NOTE:** These objectives can contribute to the goal of achieving the lowest possible accident rate and continuously improving safety.

**D.** Designing human factors training for specific organizations is often most effective considering factors such as:

- Characteristics of the people in the work force
- Physical and social conditions of the work environment
- Type of work being performed, like heavy maintenance, light maintenance, aircraft line maintenance and aircraft size and type
- Resources necessary to complete the work safely and efficiently

**E.** For initial or general human factors training, it may not be necessary for an operator to conduct an extensive job and task analysis, but to merely understand the most important safety concerns within its organization. There are many fundamental principles of human factors that apply to all maintenance work.

**F.** The aviation safety inspector (Inspector) should review proposed human factors training to ensure that it is focused on “real-world” human factors challenges faced in aviation maintenance or related work. Proposed training plans that lack sound fundamentals or examples of real world aviation maintenance challenges are likely not as acceptable or desirable for aviation maintenance human factors training.

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**G.** The design and delivery of repeated, recurrent, or continued human factors training within a specific organization should have as its basis company-specific examples derived from its event investigation system data.

**H.** A number of commercial multimedia human factors training products should receive consideration for an accepted or approved training program. However, these products are best when discussion led by a credible human factors instructor supplement them. The Inspector must review all media and movies that the application package includes to ensure suitability for all types of audiences.

**I.** The instructor should have capabilities and experience related to aviation maintenance and/or the human factors discipline that a reasonable person would accept as credible. The instructor should have effective communication skills and the ability to convey credibility to the majority of the students or course participants. An acceptable course leader's most highly preferred attribute is experience in aviation maintenance.

**J.** The following topics have been identified as important strategies for improving the work environment in order to improve human performance and minimize the potential for maintenance errors:

- 1) The noise levels should be kept low, thus requiring no ear protection; however, there may exist short periods of very high noise levels, usually due to power tool use, which require ear protection.
- 2) Work stands and platforms should be specifically configured for their intended purposes.
- 3) The use of safety equipment (such as safety shoes, ear and breathing protection, and safety lines) should be mandatory, and their use strictly enforced.
- 4) Overhead and aircraft interior lighting should be sufficient for the type of work being conducted.

### **4.24.2.9. CONSIDERATIONS FOR ACCEPTABLE CONTENT.**

**A.** An unlimited number of human performance topics are acceptable for all types of human factors training. Approval of content should be at the discretion of the Inspector and may require additional discussion or correspondence with the applicant. The Inspector should consider the

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size of an organization and the work it performs when reviewing an organization's human factors training program.

**B. General HF Training Program Contents.** General Authority of Civil Aviation (GACA), along with other regulatory agencies, including the Federal Aviation Administration (FAA), European Aviation Safety Agency (EASA) and Transport Canada (TC), has identified the following key topics for a human factors training program:

- 1) A general introduction to human factors.
- 2) Safety culture/organizational factors.
- 3) Human error, error principles, event investigation, and case studies.
- 4) Human performance and limitations.
- 5) Environments, both physical and social.
- 6) Organizational procedures, information, tools, and proper task documentation and sign-off practices.
- 7) Planning of tasks, equipment, and spares.
- 8) Communication and the lack thereof.
- 9) Teamwork and leadership.
- 10) Professionalism and integrity.
- 11) Shift and task turnover.
- 12) Undocumented maintenance.
- 13) Complacency.
- 14) Lack of knowledge.
- 15) Distraction.

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- 16) Lack of resources.
- 17) Pressures.
- 18) Lack of assertiveness.
- 19) Norms.
- 20) Stress.
- 21) Lack of Awareness.
- 22) Fatigue management/fitness for duty.
- 23) Procedural noncompliance.

**C.** The Inspector should still consider content not included in paragraph B above, if it directly relates to a case study or other scenarios that support human factors initiatives.

**4.24.2.11. APPLICATION PROCESS.** For review and approval of a human factors training program, an applicant should apply in writing to the GACA and provide all material used for the training to the GACA to ensure proper course review.

**4.24.2.13. RELATED REGULATORY AND CONTENT GUIDANCE.** For more information, consult the following documents:

- A.** GACAR Part 1, Definitions and Abbreviations.
- B.** GACAR Part 121.
- C.** Federal Aviation Administration (FAA), Advisory Circular (AC) 120-72 (as amended), Maintenance Resource Management Training, which presents guidelines for developing, implementing, reinforcing, and assessing maintenance resource management training programs for improving communication, effectiveness, and safety in maintenance operations. This AC also provides a training template.

**4.24.2.15. REFERENCES, FORMS, AND JOB AIDS.**

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### A. References:

- FAA AC 120-72, Maintenance Resource Management Training

### B. Forms:

- GACA Activity Report (GAR)

### C. Job Aid. None.

#### 4.24.2.17. PROCEDURES.

**A. Review Schedule of Events.** If this task is performed as part of an original certification, review the schedule of events to ensure that this task can be accomplished in accordance with the schedule.

#### B. Evaluate Training Program Content.

- 1) The procedures for obtaining the training program approval normally begin with a meeting between the operator's key personnel and the Inspector to discuss the scope of the training, the timing of the program document submittal, and other issues. This meeting will be an opportunity for the operator to ask questions about the GACA approval process. Although highly recommended, this is not a required meeting.
- 2) The operator may submit its training program contents as electronic media if it ensures the GACA is able to look at and store the submitted material in the media the operator selects. A transmittal document must accompany material submitted electronically. These transmittal documents may be in the form of an e-mail, fax, or letter and may include the use of electronic signatures. The operator's Director of Maintenance or someone acting on his behalf should sign the submittal. If a program is too large to send electronically, it will be the responsibility of the operator to make alternate arrangements to deliver the program to the GACA for review.
- 3) The reviewing Inspector may use the criteria and standards described in FAA AC 120-72 (as amended) and the items listed in paragraph 4.24.2.9 above, to review the content of the initial training program. Not every item listed in the guidance needs to appear in the training; but the GACA should use the list to suggest items that better meet the needs of the

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maintenance organization.

**C. Observe Operator/Applicant Performing Training.** This observation is performed regardless of whether the operator performs the training or contracts with another company.

- 1) Ensure that facilities are adequate, including classrooms, training aids, and reference materials.
- 2) Evaluate the instructor's presentation and knowledge.
- 3) The instructor should have capabilities and experience related to aviation maintenance and/or the human factors discipline that a reasonable person would accept as credible. The instructor should have effective communication skills and the ability to convey credibility to the majority of the students or course participants. Experience in aviation maintenance is an acceptable course leader's most highly preferred attribute.
- 4) The GACA does not determine instructor qualifications. However, if the GACA, through its surveillance process, finds that the qualifications or skills of an instructor are deficient, the operator must correct any deficiency associated with that instructor and with its instructor selection.
- 5) Ensure that course content and instruction is in accordance with the training syllabus.
- 6) Ensure that training recordkeeping is performed in accordance with the training program.

**D. Analyze Findings.** Evaluate all deficiencies to determine what changes will be required.

**E. Program Approval or Rejection.** The Inspector will review the proposed training program or revision and recommend to the Director of Airworthiness to either approve it or prepare an explanation of why the program or revision is not acceptable as submitted. The process for program approval found in Section 1 of this chapter should be utilized for the approval or rejection of the human factors (HF) training program.

### **4.24.2.19. TASK OUTCOMES.**

#### **A. Complete GAR.**

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**B. Complete the Task.** Successful completion of this task will result in the following:

- 1) Program approval via the OpSpecs.
- 2) The original approved program sent to the operator.

**C. Document Task.** File all supporting paperwork in the operator's file.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 25. OPERATIONAL CONTROL FOR AIR OPERATORS**

##### **Section 1. General Information**

**4.25.1.1. GENERAL.** This section contains background information, direction and guidance to be used by Principal Operations Inspectors (POIs) concerning operational control. POIs should be thoroughly familiar with this information before reviewing an air operator's Operations Manual's (OM) operational control section. Operational control, with respect to a flight, means the exercise of authority over initiating, conducting or terminating a flight. The operator's operational control system should include all of the elements of operational control and those would include e.g., crew member and aircraft requirements, lease agreements, and management personnel and persons authorized to exercise operational control etc. POIs should be thoroughly familiar with this material when preparing those portions of an operator's operations specifications (OpSpecs) that relate to operational control, to include OpSpec A8.

**A. Chapter Contents.** Section 1 of this chapter contains general information on topics pertinent to the operational control of air operations under General Authority of Civil Aviation Regulation (GACAR) Part 121 and 135. Section 2 contains information and guidance specifically related to GACAR Part 121 dispatch systems and operating rules. Section 3 contains information and guidance related to GACAR art 121 operations outside the Kingdom of Saudi Arabia (KSA) and extended overwater operations. Section 4 contains information specific to GACAR Part 135 flight locating requirements and operational rules.

**B. Regulatory Requirements.** GACAR §§ 121.1105, 121.1309, 121.1325, 121.1331 and 135.585 require GACAR Part 121 and 135 operators to exercise operational control over all flights they conduct

1) *Operational Control Functions*—General Operators conduct operational control by making decisions and performing actions on a daily basis that are necessary to operate flights safely and in compliance with the regulations. Operational control functions include crew and aircraft scheduling, accepting charter flights from the public, reviewing weather and Notices to Airmen (NOTAM), and flight planning. Another aspect consists of developing and publishing flight control policies and procedures for flight crews and other operations personnel to follow in the performance of their duties. Operators are responsible

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for collecting and disseminating information that is needed to plan and conduct flights safely, including information about en route and terminal weather conditions, navigation, and aerodrome facilities.

2) *Operational Control Systems—General* Operational control systems vary with the kind of operation the operator is authorized to conduct, the complexity of the operations, the means of communication, and with the persons who are involved in preparing for and conducting flights under the operator's system. GACAR Part 121 and 135 each contain a unique system of functional responsibility to allow each air operator to maintain operational control. Each facility contains multiple functions which, when consolidated, can provide operational control. These various functions form the basis for an operational control system which includes the functions of aircraft dispatch, flight locating and flight following, however those functions alone will not satisfy the overall goal of establishing an operational control system.

3) *Operator Oversight Responsibility*. The operator's oversight responsibility includes ensuring that both its flight crew and operational control employees comply with published policies and procedures and meet the requirements of GACAR § 121.45.

4) *Operator's Operations Manual*. GACAR §§ 121.139 and 135.85 require that operators prepare and keep current a manual for the guidance of flight, ground, and management personnel in the performance of their duties and responsibilities. The operator's OM must identify the person having overall responsibility for operational control and those persons to whom authority to exercise operational control has been delegated. The operator's OM must contain guidance on the conditions that must be met before a flight may be initiated or continued, or under which a flight must be diverted or terminated.

**C. Specific Operational Control Functions.** Operational control includes, but is not limited to, the operator's performance of the following functions:

- Ensuring that only those operations authorized by the OpSpecs are conducted
- Ensuring that only crew members trained and qualified in accordance with the applicable regulations are assigned to conduct a flight
- Ensuring that crew members are in compliance with flight and duty time limitations and rest requirements prior to departing on a flight

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- Designating a pilot in command (PIC) and where applicable an second in command (SIC) for each flight
- Providing the PIC and other personnel who perform operational control functions; with access to the necessary information for the safe conduct of the flight (such as weather, NOTAMs, and aerodrome analysis)
- Specifying the conditions under which a flight may be dispatched or released (weather minimums, flight planning, airworthiness of aircraft, aircraft loading, and fuel requirements)
- Ensuring that each flight has complied with the authorization specified for release before it is allowed to depart
- Ensuring that when the authorization specified for a flight's release cannot be met, the flight is either cancelled, delayed, rerouted, or diverted
- Monitoring the progress of each flight and initiating timely actions when the flight cannot be completed as planned, including diverting or terminating a flight

**D. Operational Control Systems.** In descending order of precision and complexity, the three general operational control systems are dispatch release (scheduled Part 121), flight release (unscheduled Part 121) and flight locating (Part 135). The operator must include, in the OM, policies and procedures appropriate to the system being used.

**NOTE:** The operator's system for exercising operational control must be described in OpSpec A8. Most operational control systems are too complex, however, to be adequately described in a single OpSpec paragraph. In such cases, the operator's system may be described in the operator's OM, and the POI may reference the OM location of this system description in OpSpec A8.

1) *Dispatch Release System.* GACAR § 121.1303(a) requires all operators conducting scheduled operations under Part 121 to have a dispatch release system as specified in GACAR § 121.1309 and generated dispatch releases in accordance with GACAR § 121.1509.

2) *Flight Release System.* GACAR § 121.1303(b) requires all operators conducting unscheduled operations under Part 121 to have either:

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- A flight release system as specified in GACAR § 121.1325 and generate flight releases in accordance with § 121.1509, or
- A dispatch release system

3) *Flight Locating System.* GACAR § 135.585 states in part “Each certificate holder conducting operations under this part is responsible for operational control. The PIC and the aircraft dispatcher, when applicable, are jointly responsible for the preflight planning, delay, and dispatch release of a flight in compliance with this part and operations specifications”. Aircraft dispatchers, when used, must be specifically designated to perform operational control functions in accordance with GACAR § 135.585(c). The operator must have procedures established for locating each flight, for which a flight plan is not filed, that:

- Provide the operator with at least the information required to be included in a VFR flight plan
- Provide for timely notification of an air traffic services (ATS) facility or search and rescue facility, if an aircraft is overdue or missing
- Provide the operator with the location, date, and estimated time for reestablishing communications, if the flight will operate in an area where communications cannot be maintained

**E. Organizational Structure.** An operational control function may be centralized in one individual or diversified throughout an operator’s organization. In practice, it is not feasible for an individual to exercise operational control without assistance in any but the simplest of flight operations. Most operators create specialized departments for crew scheduling, load control, and other functions. These functions may or may not be placed under the management of the “flight control” department. When these functions are delegated to specialized sections of the operator’s organization, the operator is responsible for the following:

- Establishing a means to ensure that all functions have been accomplished before a flight is authorized to depart
- Establishing effective internal communications, operating procedures, and administrative controls to meet this obligation

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- Ensuring that these procedures are published in the operator's OM

**F. Complex Operations.** Practical and economic considerations may motivate operators to install operational control systems that are more sophisticated than those required by the applicable regulation. Two operators that conduct operations under the same regulation may require operational control systems of differing degrees of sophistication. For example, a GACAR Part 135 unscheduled operator moving persons to and from remote locations may find a simple flight locating system to be adequate. A GACAR Part 135 scheduled operator that conducts 100 flights a day to and from major terminal areas may find, however, that a more sophisticated system is necessary to effectively control operations. The General Authority of Civil Aviation (GACA) may require that an operator establish a sophisticated operational control system as a condition of obtaining authorization to conduct specific operations.

- 1) *Evaluation.* POIs must evaluate each operator's operational control system to ensure that the operator complies with the applicable regulations and that the system is effective and provides for an adequate level of safety in the operations actually being conducted.
- 2) *Inadequate Operational Control.* A POI may find that an operator's operational control system provides an inadequate level of control to ensure safety. The facts should be evaluated, and, if required, an acceptable solution should be negotiated with the operator, ensuring that the changes are incorporated. Should the operator be unwilling to negotiate, the PI may find it necessary to amend the operator's OpSpecs in accordance with GACAR § 119.51.

**G. Services Provided by Contractors.** Operators may contract for certain equipment, facilities, and services of an aircraft dispatcher that are required by GACAR Part 121 (for example, GACAR § 121.89). Operational control responsibilities must be retained by the appropriate management personnel and anyone in a position to exercise control over operations conducted under the operating certificate.

- 1) *Part 121 Operators.* If a GACAR Part 121 operator contracts for the service of an aircraft dispatcher, the operator must maintain control over the duties, functions, and responsibilities of the contract aircraft dispatcher (see GACAR § 121.1(a)(2)). If an operator proposed to contract for the services of an aircraft dispatcher, the POI must coordinate with the Director, Flight Operations Division. The POI should thoroughly examine proposed services arrangements and responsibilities and recommend approval of services that are in

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compliance with the regulations. The GACAR do not currently have a means for approving non-certificated entities who are offering to provide aircraft dispatcher services. GACAR Part 121 requires all operators to exercise operational control. Operational control must be provided by the operator, and that responsibility may not be contracted.

2) *Part 135 Operators.* These operators may contract some functions but not their responsibility to exercise operational control over their operations. The operator is responsible for ensuring that the training and qualification of contract personnel meets any regulatory requirements, that contractor personnel are performing their duties diligently, and that the provisions of the operator's manual are being complied with by the contractor personnel. The operator must also have an effective means of maintaining responsibility for the actions and/or inactions of contract personnel when their guidance and policy is not complied with. Operators cannot under any circumstances contract responsibility for operational control (GACAR § 135.585).

3) *OpSpecs Authorization.* Any contract arrangements must be clearly and completely defined in the operator's OM and authorized by the POI in OpSpec A8.

**4.25.1.3. AIRCRAFT DISPATCHERS.** An aircraft dispatcher is an airman who holds an aircraft dispatcher certificate issued under GACAR Part 65. GACAR Part 121 operators must employ certificated aircraft dispatchers who are responsible for performing certain specified operational control functions.

**4.25.1.5. FLIGHT INFORMATION.** Operators must supply or ensure that the information necessary to plan, conduct, and control operations is available to operationally control flight crew personnel. Most of this data can be obtained through subscriptions to a government service or to a commercial aeronautical information and charting service. Operators should be expected to supplement these services if necessary, and in all cases, are responsible for ensuring that the information used is accurate and complete. Operators must also supply other data, such as notices to airmen (NOTAMs), track messages, and aerodrome obstruction data, when applicable. The operator's system to obtain and distribute aerodrome data must be described in OpSpec A9. The operator's OM must contain the guidance and procedures by which flight crew and operational control personnel can acquire and apply this information.

**A. Aerodromes and Facilities.** The KSA Aeronautical Information Publications (AIP) contains information on aerodromes and facilities that is needed by flight crew members and operational

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control personnel. POIs should inform their operators that such information is removed from the NOTAMs system when it is published in the AIP. This information is obtained from the (AIP) of the country for operations outside the KSA. Also, POIs should ensure that operators understand their requirement to make the AIP information (for those aerodromes at which operations are conducted) available to their personnel.

**B. NOTAMs.** Operators must provide NOTAMs to flight crews and operational control personnel for all GACAR Part 121 and Part 135 operations in airspace covered by NOTAM systems. Kingdom of Saudi Arabia (KSA) NOTAMs are distributed, electronically and in printed form.

**C. International NOTAMs.** International NOTAMs can be transmitted electronically to those operators that have made arrangements to receive them.

**D. Operations Not Covered by NOTAMs.** Operators under GACAR Part 121 or Part 135 may need to establish procedures or systems to develop or disseminate flight safety information concerning areas not covered by KSA NOTAMs, such as isolated aerodromes or offshore operations.

**E. Track Messages.** Messages containing the coordinates of routes to be followed on flexible track systems such as the North Atlantic organized track structure or the Western Pacific flexible track structure are transmitted approximately every 12 hours. Western Pacific and Northern Pacific Track NOTAMs are also available as international NOTAMs under the location identifiers of the respective air route traffic control center; examples are Oakland Center (KZOA) or Anchorage Center (PAZA). Flight crews operating over these routes are required to have all current, valid track coordinates available in the cockpit to verify flight plan coordinates, should an in-flight rerouting become necessary. PIs must ensure that an operator's operational control personnel have this information for flight planning and flight monitoring purposes.

**F. Aircraft Performance and Aerodrome Obstacle Data.** POIs must ensure that operators of all types of aircraft comply with the performance requirements of Subpart F of GACAR Part 121 or 135, as applicable, before a flight departs. Operators of transport category and commuter category airplanes must obtain and use aerodrome obstacle data for takeoff performance calculations (see Volume 5, Chapter 3, Airplane Performance and Aerodrome Data). Operators of all categories of aircraft must comply with en-route obstacle clearance requirements, including contingency planning for engine failure.

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### 4.25.1.7. COMMUNICATION AND NAVIGATION FACILITIES.

**A. Dispatch Release System.** No flight may be dispatch over an approved route or route segment unless the communication and navigation facilities required by GACAR §§ 121.85, 121.89, and 121.97 for the approval of that route or segment are in satisfactory operating condition. If, because of technical reasons or other reasons beyond the control of the operator, the required facilities are not available over a route or route segment outside the Kingdom of Saudi Arabia (KSA), the operator may dispatch an aircraft over that route or route segment if the PIC and aircraft dispatcher find that communication and navigation facilities equal to those required are available and are in satisfactory operating condition.

**B. Flight Release System.** No flight may be released over any route or route segment unless communication and navigation facilities equal to those required by GACAR §§ 121.85, 121.89, and 121.97 are in satisfactory operating condition.

### 4.25.1.9. WEATHER INFORMATION FOR CONTROL OF FLIGHT OPERATIONS.

POIs must ensure that the system the operator uses to obtain and disseminate aeronautical weather data is either described in OpSpec A9, or that the system description, if in the operator's OM instead, is referenced in OpSpec A9.

**A. Sources of Forecasts.** All weather forecasts must be based on data obtained from a MET provider authorized under GACAR Part 179 or a foreign source acceptable to the President. POIs should ensure that operators obtain forecasts from approved sources.

**B. Weather Reports and Forecasts for Takeoffs and Landings.** Operators must obtain and use a current weather report or forecast before taking off, landing, or beginning an instrument approach. The visibility and ceiling values (when applicable) in the body of the report are controlling for these operations. A reported observation of Runway Visual Range (RVR) on the runway to be used, is controlling (GACAR Part 121 operations only), when such reports or forecasts are available. For GACAR Part 135 operations, if the visibility and ceiling are below minimums, the reported RVR may be used if that RVR is at or above the minimums for the instrument procedure being used and authorized for that operator.

**C. Weather for Dispatch/Flight Release and Flight Locating.** GACAR Part 121 and 135 contain a number of rules that require operators to use "appropriate weather reports or forecasts or any combination thereof, which indicate the weather conditions at the estimated time of arrival." The GACA has determined that this language means that the critical time period is the

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estimated time of arrival (ETA). POIs must ensure that operators use all available weather reports and forecasts, as applicable, to cover this time period. If these weather reports are accessed via the Public Internet, the operator should use a Qualified Internet Communications Provider (QICP). Additional guidance may be found in Federal Aviation Administration (FAA), Advisory Circular 00-62, Internet Communications of Aviation Weather and NOTAMs. These QICP are approved only to the extent that their security practices which protect the approved weather data from unauthorized modification are adequate.

1) *Use of Forecasts for Long Range Operations.* Clearly, current weather reports are of less value than forecasts for long range operations. A flight may be released to a destination that is currently below minimums but that is forecast to be above minimums at the ETA. In this case the use of hourly reports to monitor trends is prudent and may be required to meet the intent of the rule.

2) *Release of Flights Based on Forecast Weather Information.* Operators may be required to release flights with limited weather information. For example, a transcontinental flight or a trans-oceanic flight operating in either direction, may depart several hours before the destination aerodrome opens and the first routine scheduled weather observations of the day are taken. An operator, aircraft dispatcher, or PIC who operates a flight under such conditions would be considered to be in compliance with the GACAR under the following conditions:

- Those weather reports and forecasts which are available have been obtained and used
- Adequate contingency plans have been made to deal with the situation, should later reports be unfavorable

3) *Use of Pilot Reports.* The term, “available reports,” includes pilot weather reports.

4) *Specific Part 135 Requirements.* GACAR § 135.659(c) requires “weather observations made and furnished to pilots to conduct IFR operations” are to be taken at the aerodrome where those operations are to be conducted, unless the operator has been issued authorization by OpSpecs to use an observation taken at another location.

**D. Conditional Phrases in Weather Forecasts.** Conditional phrases contained in the remarks section of a forecast, in addition to the information contained in the main body of the forecast, are controlling for purposes of a flight dispatch.

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**E. Adverse Weather.** GACAR §121.93 requires operators to have a system for obtaining reports and forecasts of adverse weather for each route and aerodrome used. GACAR § 121.1353 requires that the aircraft dispatcher provide this information to the PIC.

**4.25.1.11. FLIGHT PLANNING.** POIs must ensure that operators conduct preflight planning so that flights are conducted as follows: to the standards of navigational accuracy required in the airspace traversed, to meet regulatory fuel requirements, to satisfy ATC information and reporting requirements, and to ensure that flights are operated safely. The degree of sophistication and accuracy required in flight planning depends on the type of navigation conducted and on the airspace traversed. Operators may assign flight planning duties to either flight crew or operational control personnel. It is a common and acceptable practice for operators to contract for flight planning from specialized services. The operator, however, is responsible for the accuracy of any information the contractor uses and for the accuracy of the results.

**A. Flight Plans.** The term “flight plan” means a paper document or a file of electronic data prepared for purposes of flight planning, flight control, and navigation. Flight planning consists of selecting an appropriate aircraft cruise schedule and applying forecast wind, temperature, and aircraft performance data to a planned route to predict estimated time en route (ETE) and estimated fuel consumption. The term “ATC flight plan” is used in this chapter to mean the subset of information extracted from the flight plan, which is filed with ATC to obtain an ATC clearance.

**B. Computation and Verification.** A flight plan may be computed manually or with computer aids. In either case, POIs must ensure that the operator’s OM contains the specified procedures, formats, and forms to be used. POIs shall ensure that operators understand their responsibility for making sure that flight crew and operational control personnel verify the accuracy of planning. Since even computer generated flight plans are subject to input errors, the use of a computer system that contains internal software to check for errors in flight plans is desirable. PIs shall also ensure that the operator’s OM contains adequate procedures for flight crew and operational control personnel to use to scrutinize all flight plans, both computer generated and manually generated, for accuracy.

**C. Part 121 Requirements.** GACAR Part 121 operators are required by GACAR §§ 121.1521(a) and 121.1525(a) to carry a flight plan to destination on all flights. Operators typically require that flight crews record the flight progress on the flight plan or on other documents.

**D. Navigation Methods and Flight Plans.** POIs should keep in mind that the primary concerns

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in choosing navigation methods and procedures are the degree of precision required for the separation of air traffic and obstacle avoidance.

1) *Station Referenced Navigation.* Station referenced navigation is VFR or IFR navigation within the standard operational service volumes and along established routes of ground based NAVAIDs meeting International Civil Aviation Organization (ICAO) requirements. Courses and distances are published on standard IFR charts or may be determined by plotting courses on an IFR or VFR chart. To be acceptable for station referenced navigation, a simple flight plan should include at least the following:

- Fix or intersection identifiers, segment distances, ETEs for each segment, and an estimate of fuel consumption for each segment (A segment or zone is the distance between two check points)
- A summation of distance, time, and fuel to show regulatory compliance

2) *Long Range Navigation.* Long range navigation is navigation conducted beyond the operational service volume of standard ICAO compliant ground based NAVAIDs. Long range navigation normally requires specialized long range navigation systems such as Omega/VLF, inertial navigation systems (INS), inertial reference systems (IRS), or GNSS. In some cases, dead reckoning (DR), pilotage, or celestial navigation may be used. An acceptable flight plan for long range navigation should contain the following elements:

- Waypoints (Fixes for the portion of the route conducted using station referenced navigation)
- The waypoint coordinates identifier (located next to the waypoint or on the line below)
- The course leaving the waypoint
- Forecast segment wind, drift, or drift correction
- Forecast temperature (or temperature deviation) and true air speed (TAS)
- Segment distances, estimated ground speed, and segment ETE

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- Estimate of fuel consumption for each segment
- Indication of equal time points (ETP), if they are used for compliance with engine out fuel or oxygen requirements
- A summation of distance, time, and fuel to indicate regulatory compliance
- A means of predicting clear air turbulence, such as the height of the tropopause, maximum wind level, temperature gradients, or shear index

3) *Performance-Based Navigation (PBN)*. Performance-based navigation includes Area Navigation (RNAV) methods in airspace where required navigation performance has been established. An acceptable flight plan for PBN should contain the following elements:

- Waypoints
  - The waypoint coordinates identifier (located next to the waypoint or on the line below)
  - The course leaving the waypoint
  - Forecast segment wind, drift, or drift correction
  - Forecast temperature (or temperature deviation) and true air speed (TAS)
  - Segment distances, estimated ground speed, and segment ETE
- Estimate of fuel consumption for each segment
- Indication of equal time points (ETP), if they are used for compliance with engine out fuel or oxygen requirements
- A summation of distance, time, and fuel to indicate regulatory compliance
- A means of predicting clear air turbulence, such as the height of the tropopause, maximum wind level, temperature gradients, or shear index

4) *Celestial Navigation*. When navigation is conducted by celestial means, flight planning

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requires current navigation charts, a current air almanac, and sight reduction tables. The operator's OM must contain specific procedures to be used for flight planning, the required forms, and the procedures for checking the validity of the planning conducted.

5) *Organized Track Systems.* When operations are conducted over an organized track system, the flight plan coordinates must be checked against the track message. The operator's OM must specify the individual responsible for the check and the procedures to be used.

**NOTE:** The following FAA AC's contain guidance for approving operations in minimum navigation performance specification (MNPS) airspace:

- FAA AC 91-49 (as amended), General Aviation Procedures for Flight in North Atlantic Minimum Navigation Performance Specifications Airspace.
- FAA AC 120-33 (as amended), Operational Approval of Airborne Long Range Navigation Systems for Flight within the North Atlantic Minimum Navigation Performance Specifications Airspace.

**E. Pilotage.** Pilotage is navigation conducted solely by reference to visually distinguishable checkpoints. Pilotage may only be approved over areas where checkpoints are readily distinguishable and in airspace where such operations are authorized. VFR navigation by pilotage may only be conducted by operators as follows:

1) *Part 121.* These operators may conduct VFR navigation only when and where specifically authorized to do so by the OpSpecs.

2) *Part 135.* These operators may conduct VFR navigation by pilotage in airplane and rotorcraft without specific authorization by OpSpecs.

3) *Flight Planning for VFR Pilotage.* VFR pilotage requires the use of current VFR navigation charts. POIs must evaluate an operator's flight plan to ensure that it includes, but is not limited to, the following elements as applicable to the operation:

- Checkpoints, segment distances, ETEs for each segment, and an estimate of fuel consumption for each segment

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- A summation of distance, time, and fuel planning to show regulatory compliance (departure point to destination, required reserve, and contingencies)

**F. Dead Reckoning (DR).** DR is navigation conducted solely by the pilot flying a calculated heading and estimated groundspeed without a means of obtaining a position. The pilot computes such headings by applying estimated wind information to the measured track. Navigation by DR is only acceptable under certain limited circumstances. For example, operators may be approved by the OpSpecs to conduct either IFR or VFR flights between the service volumes of two standard NAVAIDs on a direct course between the aids. Such operations must be limited to periods of not more than 1 hour and to areas where ATC separation standards do not preclude such operations. POIs must evaluate other DR operations on a case by case basis.

**4.25.1.13. SELECTION OF ALTERNATE AERODROMES.** A critical element of preflight planning is the selection of alternate, takeoff, en-route, and destination aerodromes. PICs and operational control personnel have a range of latitude to accommodate individual circumstances. Operators must provide specific direction and guidance to PICs and aircraft dispatchers for the selection of takeoff, en-route, and destination alternate aerodromes.

**A. Terrain.** GACAR § 91.43 requires that PICs familiarize themselves with “all available alternatives if the planned flight cannot be completed.” GACAR § 91.257(a) requires the PIC to land at the “nearest suitable aerodrome” in case of an engine failure or shutdown. A PIC operating an airplane of three or more engines may proceed to an aerodrome other than the nearest suitable aerodrome when this course of action is as safe as landing at the nearest suitable aerodrome. While these rules apply specifically to PICs, operational control personnel should be aware of, and be guided by, these requirements when selecting alternate aerodromes. POIs shall ensure that operators and PICs take particular care in the selection of alternate aerodromes in mountainous areas. POIs should ensure that the operator would be in compliance with Subpart F of GACAR Part 121 or 135 (in normal and engine out configurations) while en route to the alternate aerodrome.

**B. Weather, NAVAIDs, and Aerodrome Conditions.** Aircraft dispatchers, flight followers, and PICs must be aware of the distance to the alternate, the effect of weather, inoperative NAVAIDs, and aerodrome conditions when selecting alternate aerodromes. Inoperative NAVAIDs, runway conditions, or runway closures can render an aerodrome unacceptable as an alternate aerodrome.

**4.25.1.15. LOAD CONTROL.** When heavy payloads are carried aboard an aircraft, the fuel load may

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have to be limited. In addition, the mass at which an aircraft can be released is limited by takeoff, en-route terrain clearance, and landing performance limitations (see Volume 5, Chapter 3).

**A. Loading Assumptions.** Operational control personnel must have either actual loading information or they must make assumptions about aircraft loading before they can release a flight. For flights released using loading assumptions, POIs must ensure that the operator has established a means for ensuring that flights actually do depart at, or below, the maximum mass used for planning.

**B. Operations Manual.** POIs must ensure that the operator's OM contains information and procedures for the control of fuel load, payloads, takeoff mass, and CG. The operator's OM must clearly delineate the category of employee responsible for making these computations, adequate information and procedures for performing such calculations, and the procedures by which the flight crew and operational control personnel can ensure that these functions have been accomplished before the aircraft departs.

**4.25.1.17. AIRWORTHINESS OF AIRCRAFT.** GACAR § 121.1347 prohibits the dispatch or release of an aircraft unless it is airworthy and has all required equipment installed, as prescribed in GACAR § 121.513. GACAR § 121.1545 requires that before an aircraft can be operated it must have an Airworthiness Release (or appropriate logbook entry) and be signed by a properly authorized person.

**A. Compliance with Minimum Equipment List (MEL) or Configuration Deviation List (CDL) Provisions.** When an aircraft is released in accordance with MEL or CDL provisions, the operator's procedures, policies, instructions, and controls for the use of the MEL or CDL must ensure that:

- There are no known conditions that would make the aircraft un-airworthy
- The aircraft is in condition for safe operation

**NOTE:** Use of the MEL or CDL does not require a new airworthiness release. Under certain circumstances, however, approved company procedures may require the issuance of a new airworthiness release. In any event, POIs shall ensure that operators follow the approved procedures.

**B. MEL or CDL Limitations in Dispatch Releases.** When MEL or CDL restrictions impose

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aircraft performance or mass limitations, the aircraft dispatcher must be notified of these limitations before the flight is dispatched. It is not unusual for additional discrepancies to arise after a release has been prepared and transmitted. When a decision has been reached to operate the aircraft with an additional deferred discrepancy after the release has been prepared, the operator must have procedures for notifying the aircraft dispatcher. If the flight cannot be operated as originally released, a new release must be prepared or the original release must be amended.

**C. Discrepancies After Departure.** A flight is considered to have departed when it moves under its own power (forward or backward) for purposes of flight. After this time, any discrepancy that arises must be handled according to the flight manual. If the flight manual has procedures for that particular discrepancy, which allow for the continuation of the flight, and the PIC determines that the flight can safely depart using those procedures, then the flight may continue. If the flight manual does not permit continuation of the flight, or if the PIC determines that the flight cannot safely depart, the discrepancy must be entered in the maintenance log in accordance with GACAR §§ 121.1193 or § 135.691(b) and maintenance action must be taken in accordance with GACAR § 121.1545 or § 135.691(c) before the aircraft takes off. A new or amended release is required when the flight cannot be operated as originally planned. For example, the anti-skid could fail during the taxi for takeoff. If the flight manual contains procedures for adjusting performance computations which indicate that the flight can operate within the required limits at the departure point, destination, and alternate aerodrome, the flight could continue. Conversely, if the flight handbook does not contain any such procedures, the flight must return for maintenance action.

**4.25.1.19. CREW QUALIFICATION AND CREW FLIGHT TIME LIMITATIONS AND REST REQUIREMENTS.** The operator is responsible for assigning specific personnel to operate each flight, including the designation of a PIC. Crew members and the operator are jointly responsible for ensuring that crew members are qualified in accordance with the regulations and are in compliance with crew flight time limitations and rest requirements before the flight departs. Operators may delegate these responsibilities to departments (i.e., crew scheduling) other than the operational control department, but must establish procedures by which operational control personnel can verify that these requirements have been accomplished.

**NOTE:** Operators should have policies in place addressing flight leg assignment and the division of crew duties during critical phases of flight when environmental conditions (cold weather operations, windshear, thunderstorms, etc.) are marginal. Special consideration should be given to line flying experience and background qualifications in determining

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when the PIC may delegate control of the aircraft and under what adverse weather conditions control of the aircraft should be accomplished by the PIC.

### **4.25.1.21. CREW MEDICAL QUALIFICATION AND PROCEDURES DURING TEMPORARY MEDICAL DEFICIENCY.**

**A. Responsibility of Operators and Flight Crew Members.** GACAR § 61.9 preclude required flight crew members from flight duty while they have a known medical or physical deficiency. These sections rely solely on the ability of flight crew members to honestly determine their medical fitness. It is incumbent on individual airmen to be certain that they have no illness or physical impairment that would affect their medical fitness for flight. It is not always easy for operators to determine the extent of a crew member's medical fitness. In order to maintain the highest level of safety, required flight crew members must not fly under conditions that would make them unable to meet the requirements for their current medical certificate. This decision should not be influenced by fear of company reprisals.

**B. POI Responsibility.** POIs should encourage their assigned air operators to have established sick leave policies and procedures, especially those concerning the release of flight crew members from duty when they develop sudden temporary illnesses, such as colds, flu, or fevers. These policies and procedures should not discourage flight crew members from taking sick leave when they are ill.

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#### **CHAPTER 25. OPERATIONAL CONTROL FOR AIR OPERATORS**

##### **Section 2. Part 121 Dispatch Release Systems**

**4.25.2.1. GENERAL.** This section contains information and guidance to be used by principal operations inspectors (POIs) concerning dispatch release systems utilized by General Authority of Civil Aviation Regulation (GACAR) Part 121 operators. Operators conducting scheduled operations must have a dispatch release system as specified in GACAR § 121.1309 and generate dispatch releases in accordance with GACAR § 121.1509.

**A. Signature on a Dispatch Release.** The GACARs require that both the aircraft dispatcher and the pilot in command (PIC) sign the dispatch release. The dispatcher's and PIC's signatures certify that, in the judgment of each, the flight can be made safely as planned.

1) The conditions under which a flight is dispatched may make it impractical for both the aircraft dispatcher and the PIC to sign on the same form. For example, the operator may maintain a centralized dispatch center and transmit dispatch releases to each point of departure rather than maintain individual dispatch facilities at each aerodrome. Operators may establish procedures that comply with the intent of the rule, but accommodate the necessities of contemporary operations. One acceptable practice is for an aircraft dispatcher to sign a duty roster at the beginning of the dispatcher's shift, thus indicating the time the aircraft dispatcher came on duty and the desk or geographic area the dispatcher is working. The aircraft dispatcher's name and a date-time group printed on each dispatch release may be considered the aircraft dispatcher's signature in combination with the duty roster. Another acceptable practice is for the aircraft dispatcher to sign and retain for the record a copy of each dispatch release which is transmitted.

2) POIs, operators, and aircraft dispatchers should be aware of the significance of an individual's signature, being that the individual who signs has consented to be bound by, and held responsible for, the act.

3) An aircraft dispatcher may conduct an inflight re-release by recording the re-release message on oral tape or in writing. A system of appending the aircraft dispatcher's signature may be used. The PIC may accept an inflight re-release over a radio by reading back the

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dispatch release message, recording the message in writing (including the dispatcher's name), noting the date and time, and signing the entry. The preferred procedure is for the message to be copied on a designated master flight plan. These same procedures may be used for releases delivered over the telephone. The signed dispatch releases, duty rosters, and the master flight plan are company records that must be retained.

**B. Preflight Briefing.** Before dispatching any flight, an aircraft dispatcher must be thoroughly familiar with the reported weather conditions and the forecast weather conditions (including adverse weather) and the status of communications, navigation, and airport facilities. GACAR § 121.1353(a) requires the aircraft dispatcher provide the PIC with a preflight briefing on each of these items.

- 1) The preflight briefing may be delivered verbally or in writing. In the latter case, communications facilities must be available for the aircraft dispatcher and the PIC to communicate directly by voice if direct communication is required or desired.
- 2) The intent of GACAR § 121.1353(a) is that the aircraft dispatcher and the PIC have adequate and identical information for planning. The PIC and the aircraft dispatcher must be thoroughly familiar with, and consider all aspects of, the situation. For example, inoperative navigation aids and shortened runways as well as weather conditions can affect the selection of alternate airports. For this reason the briefing by the aircraft dispatcher is not optional for either the dispatcher or the PIC under these rules.

**C. Flight-Monitoring.** Per GACAR § 121.1321, an aircraft dispatcher must monitor the progress of each flight under that dispatcher's control until the flight has landed, passed beyond the dispatcher's area of control, or until the dispatcher is properly relieved by another aircraft dispatcher. Flight monitoring, as a minimum, must consist of the monitoring of each flight's fuel state, flight time remaining, destination and alternate aerodrome weather trends, en route winds and weather (including pilot reports), and the status of aerodrome and navigational facilities.

- 1) GACAR § 121.1321(a)(2) requires that the aircraft dispatcher report to the PIC any additional information that could affect the safety of the flight. This information may be delivered by voice message or by other means, such as air-ground passive communication systems (ACARS).
- 2) GACAR § 121.85 requires rapid and reliable two-way radio communications between each flight and the aircraft dispatcher be available over the entire route of flight.

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**D. Operations Manual (OM).** POIs must ensure that the operator's OM contains policies and procedures for releasing flights and subsequent inflight monitoring. GACAR § 121.151 requires that the manual or applicable parts be available to aircraft dispatchers during the performance of their duties. POIs must ensure that the operator's OM includes the following information:

- 1) The operator's OM must contain flight crew reporting requirements and the actions that aircraft dispatchers should take if reports from the flight crew are not received.
- 2) Once initiated, a flight must continue to destination as planned and in accordance with the conditions of the release. A PIC may not continue to destination, however, when in the opinion of either the PIC or the aircraft dispatchers, it is unsafe to do so. In such cases, the PIC must take action to obtain the concurrence on a new course of action and then amend the release, as applicable.
- 3) ATC frequently delays, re-routes, or assigns altitudes to flights other than those planned by the operator. The ATC system requires this flexibility to re-route traffic flow around adverse weather and to function effectively. The operator's policies and procedures for operational control should accommodate these demands while maintaining the responsibility shared by the aircraft dispatchers and the PIC.

**NOTE:** GACAR §121.1129(a) authorizes the PIC to deviate from the conditions of the dispatch release to the extent necessary for safety in an emergency. When the PIC exercises this authority, GACAR § 121.1129(c) requires that the PIC keep both ATC and the aircraft dispatcher fully informed of the progress of the flight. GACAR §121.1129(c) requires that when emergency authority is exercised, a written report be forwarded within 10 working days to the President, through the operations manager.

**4.25.2.3. PREPARATION OF OPERATIONAL FLIGHT PLAN (OFP).** An operational flight plan must be completed for each flight. The aircraft dispatcher must prepare the OFP and include it in the dispatch release in accordance with GACAR § 121.1509.

**NOTE:** See GACAR § 121.1513 for guidance on the content of the OFP.

**4.25.2.5. FACILITIES AND STAFFING.** GACAR §§ 121.105 and 121.1309 require that each operator provide enough dispatch centers and qualified aircraft dispatchers to ensure adequate operational control of each flight.

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**A. Facilities.** GACAR §121.105 requires that each operator provide enough dispatch centers for adequate control of the operations conducted.

- 1) Operators have wide latitude in meeting this requirement. With modern communications, many operators exercise worldwide operational control from a single center. Any number and placement of centers is acceptable, provided the operator can show that organizational and communications arrangements are effective.
- 2) Many operators have chosen to automate some dispatch duties and routines. A few operators have introduced a high degree of automation. Many functions which were previously performed manually by human beings are now handled automatically by machine. For example, flight routes are automatically generated and flight plans are filed by computer. While these systems may be labor saving, they introduce special problems and specific hazards. POIs must ensure that the operator has designed adequate safeguards into the system. For example, the operator must be able to ensure that a flight plan with a routing identical to the one filed with ATC is delivered to the PIC.

**B. Staffing.** GACAR § 121.1309 requires that operators provide enough qualified aircraft dispatchers to ensure the adequate operational control of all flights as follows.

- 1) GACAR §121.965 requires that each aircraft dispatcher be “familiar with all essential operating procedures for that segment of the operation over which he exercises dispatch jurisdiction.” This requirement applies to all aircraft dispatchers the operator assigns to revenue flights (including the management personnel who occasionally work a position to relieve personnel), and to those aircraft dispatchers who trade assignments for personal reasons. POIs should ensure that operators have established a means of qualification to satisfy this rule. The rule also allows aircraft dispatchers to dispatch flights over segments on which they are not qualified after coordinating with a qualified aircraft dispatcher. Operators who use this provision must show that the supervising aircraft dispatcher has adequate time to oversee the aircraft dispatcher unfamiliar with the area without undue distraction from other assigned duties.
- 2) Aircraft dispatchers commonly dispatch and monitor flights simultaneously. POIs must ensure that operators provide enough dispatch personnel to fully accomplish both tasks. POIs should ensure that the operator’s dispatchers are not neglecting flight monitoring duties due to the pressure of their duties for originating flights.

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- 3) The time required for an aircraft dispatcher to prepare a dispatch release or to monitor the progress of a flight varies according to the geographical area the aircraft dispatcher is working, the complexity of the operation, and the degree to which the process is automated. An aircraft dispatcher employed by a small operator may do all of these tasks manually without assistance and may take several hours to dispatch a single flight. On the other hand, an aircraft dispatcher for a major air operator may be able to adequately dispatch a flight in a few minutes by using a computerized system.
- 4) With all operators, workloads tend to be cyclical with peaks and valleys. Operators should continually monitor aircraft dispatcher workloads at peak periods to ensure that the dispatchers are not overloaded. One acceptable means of controlling routine workloads is for operators to assign aircraft dispatchers to specific geographical areas and to regulate the number of flights an aircraft dispatcher is to work in each hour and in each shift.
- 5) The operator must have adequate contingency plans for dealing with foreseeable non-routine operations. For example, when a major storm system moves across an area and ATC central flow control begins rerouting traffic, an aircraft dispatcher's workload can increase to several times the routine level. One acceptable means of dealing with this problem is for the operator to add more aircraft dispatchers during periods of non-routine operations. The contingency plan may require the re-assignment of flight monitoring responsibilities to reduce the number of flights being handled by the affected aircraft dispatcher.
- 6) Operators conducting "hub operations" have special problems complying with the combined requirements of GACAR §§ 121.105, 121.1309, 121.85 and 121.1353. For example, if weather conditions unexpectedly restrict operations or close a hub while flights are inbound, the operator must demonstrate the capability to communicate with, and effectively control, a large number of flights in a short period of time.
- 7) POIs shall ensure that operators using automated systems have published procedures for maintaining operational control after an unexpected loss of an automated system. These procedures should be published in the operator's OM.

**4.25.2.7. AIRCRAFT DISPATCHER DUTY TIME LIMITATIONS.** POIs must ensure that operators place the following limitations on aircraft dispatcher duty time, (except in cases of circumstances or emergency conditions that are beyond the control of the operator) in accordance

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with GACAR §121.1037.

- An aircraft dispatcher may not be scheduled for more than 10 consecutive hours of duty
- When an aircraft dispatcher is scheduled for more than 10 hours of duty in 24 consecutive hours, a rest period of at least 8 hours must be provided at, or before, the end of 10 hours of duty
- Each aircraft dispatcher must be relieved of all duty for at least 24 consecutive hours during any 7 consecutive days or the equivalent thereof during any calendar month

**NOTE:** Per GACAR §121.1037(c), an operator may, if authorized by the President, schedule an aircraft dispatcher at a location outside of the Kingdom of Saudi Arabia (KSA) for more than 10 consecutive hours of duty in a 24-hour period if that aircraft dispatcher is relieved of all duty with the operator for at least 8 hours during each 24-hour period. POIs should ensure that this provision is used to comply with local work customs and that it does not provide for fewer personnel than required to maintain adequate operational control.

- A. An aircraft dispatcher's shift must be scheduled to begin at a time that allows the dispatcher to become thoroughly familiar with existing and anticipated weather conditions along the route before dispatching any flight. The aircraft dispatcher must remain on duty until each flight under the aircraft dispatcher's control has either landed, or gone beyond the dispatcher's jurisdiction, or until the aircraft dispatcher is relieved by another qualified aircraft dispatcher. These requirements necessitate a change-over procedure between the oncoming aircraft dispatcher and the aircraft dispatcher being relieved.

**4.25.2.9. DISPATCH RELEASE WEATHER REQUIREMENTS.** POIs must be informed about the weather requirements for the dispatch of any flight under GACAR Part 121.

**A. Dispatch Under VFR.** GACAR §121.1365 prohibits an aircraft dispatcher from releasing a flight for VFR operations unless the ceiling and visibility en route and at the destination is VFR and will remain above applicable VFR minimums, until the aircraft arrives at the aerodrome or aerodromes specified in the dispatch release.

**NOTE:** GACAR Part 121 flights may not be dispatched under VFR rules unless they are specifically authorized by Operations Specification (OpSpec) B51.

**B. IFR Takeoff Weather Minimums.** Per GACAR § 121.1389, an aircraft dispatcher may not

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release a flight when the weather at the departure point is reported to be less than the takeoff minimums specified in OpSpec C56. The weather conditions may, however, be below the landing minimums specified in the operator's OpSpecs for the aerodrome. In this case the aircraft dispatcher may not release the flight unless the following conditions exist:

- 1) For a two-engine airplane, an alternate aerodrome is available, which is not more than one hour from the departure aerodrome at normal cruising speed, in still air, with one engine inoperative.
- 2) For an airplane with three or more engines, an alternate aerodrome is available which is not more than 2 hours from the departure aerodrome at normal cruising speed, in still air, with one engine inoperative.
- 3) The alternate aerodrome required by subparagraph 1) or subparagraph 2) must meet the requirements of the operator's OpSpecs.
- 4) The weather conditions at the designated takeoff alternate at the estimated time of arrival (ETA) meet the requirements of OpSpec C55.

**C. Destination Weather IFR-Operations.** GACAR §121.1369 prohibits an aircraft dispatcher from releasing a flight under IFR or over-the-top rules unless weather reports and/or forecasts indicate that the weather will be at, or above, minimums required in the OpSpecs at the destination aerodrome at the ETA.

**D. Alternate Weather.** GACAR §121.1393(a) prohibits an aircraft dispatcher from releasing a flight under IFR or over-the-top rules unless at least one alternate aerodrome is listed for each destination aerodrome in the dispatch release and at which the weather exceeds the alternate aerodrome requirements in OpSpec C55. An alternate aerodrome does not have to be designated, however, when for a least one hour before to one hour after the ETA, the appropriate weather reports or forecasts, or any combination thereof, indicate the following:

- The ceiling will be at least 2000 ft (610 m) above the aerodrome elevation
- The visibility at that aerodrome will be at least 5 km

**E. Designation of Two Alternate Aerodromes.** When weather conditions at the destination aerodrome and the first alternate aerodrome are marginal, GACAR § 121.1393(a) requires that at

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least one additional alternate aerodrome be designated. The term “marginal” as applied to alternate minimums, is not defined by regulation. To some extent this is because the definition of what constitutes “marginal” depends on the nature of the weather phenomena, the operation conducted, and the equipment used. POIs should ensure that the definition of marginal, and of the conditions under which a second alternate aerodrome must be designated are clearly stated in the operator’s OM.

**4.25.2.11. DISPATCH RELEASE: FUEL AND OIL SUPPLY.** POIs need to be aware of the fuel requirements for dispatch under GACAR Part 121 rules (see Section 3 of this chapter for fuel requirements in extended overwater operations). The fuel planning provisions found in GACAR § 121.1381 apply to all flights.

**A. Required Fuel Supply.** An operator may not dispatch a flight, and a flight may not take off unless, considering winds and forecast weather conditions, the flight carries all of the required fuel. The President may amend the OpSpecs to require more fuel than any of the required minimums if he finds that the additional fuel is necessary on a particular route in the interest of safety.

**NOTE:** The operator’s OM should contain policies and instructions to aircraft dispatchers and PICs for computing the amount of fuel to be carried under the circumstances likely to be encountered in the operator’s specific operation.

**NOTE:** When computing fuel requirements, all fuel must be in addition to unusable fuel.

**B. Departure Fuel.** GACAR § 121.1381 requires the fuel listed in previous subparagraph A above, be on board the aircraft at takeoff. The dispatch release must display this amount. The operator’s OM should contain a clear statement of this point for pilots, aircraft dispatchers, and load planners.

**4.25.2.13. DISPATCH RELEASE.** A flight conducted under GACAR Part 121 rules may not depart from the point of origin unless a dispatch release contains specific authorization for the flight between specified points. The dispatch release may be for a single flight or for a series of flights with intermediate stops.

**A. Required Dispatch Release Elements.** POIs must ensure that operators require that dispatch releases be recorded in writing and contain at least the following information:

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- Aircraft identification marks/number
- The name of the dispatcher with operational control of the flight
- The signature(s)/acceptable certification required by GACAR § 121.1313
- Names of the crew members
- ATC flight plan required by GACAR § 91.73
- Flight number
- The OFP contents required by GACAR § 121.1513
- Departure aerodrome, intermediate stops, destination aerodromes, and alternate aerodromes
- The type of operation (IFR or VFR)
- Minimum fuel quantity required by GACAR § 121.1381

**B. Required Dispatch Release Attachments.** The regulations require that a dispatch release contain or have attached: available weather reports, weather forecasts (or a combination thereof) for the destination aerodrome, intermediate stops, and alternate aerodromes that are the latest available at the time the release is signed by the pilot.

- 1) The term “available” reports include pilot reports.
- 2) Any additional weather reports or forecasts that the PIC or the aircraft dispatcher considers necessary or desirable must be included.
- 3) The operator must establish procedures to ensure, when a flight has been dispatched but is unable to depart as scheduled, that the weather information is updated and is the latest available at the time of actual departure (takeoff). The operator may include procedures in the OM to have the aircraft dispatcher forward to the flight crew any new weather information which may be operationally significant as soon as practical after the aircraft departs.
- 4) To ensure that the weather information is updated, the aircraft dispatcher must prepare a new dispatch when a flight takes off and then returns to the point of departure.

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**C. Dispatch Release - Additional Information and Conditions.** While a dispatch release must contain the information specified in previous subparagraphs A and B, it is not limited to that information. Additional information and conditions should be placed on or attached to the release. For example, when an inflight re-release is planned, a statement to that effect should appear on the release. When a flight is planned under conditions which could limit the PIC's discretion, those conditions should be indicated. For example, when a flight can be legally and safely conducted over the most direct route between two points, but not over possible alternate routings that ATC might assign; that statement should be noted on the release. The regulations require that the aircraft dispatcher report adverse weather to the PIC. GACAR §121.1509(b) requires the dispatch release form contain a statement for the PIC to certify all the requirements of GACAR § 91.43(b) have been met. One acceptable means an operator may use to inform the PIC that there are or are not attachments is to place a statement to this effect on the release.

**D. Dispatch Release Time Limits.** When an aircraft is released for a series of flights, the aircraft may only remain on the ground for one hour at the intermediate stop. If the ground time exceeds one hour, a new dispatch release is required regardless of the scheduled ground time.

**E. Destination.** An aircraft dispatcher may designate any aerodrome that is listed in OpSpec C70 for the type of aircraft, as the destination for the purpose of the original dispatch. When a flight is dispatched to or from a refueling, alternate, or provisional aerodrome, the requirements applicable to dispatch from regular aerodromes apply.

**F. Aerodromes Not Listed in OpSpec C70.** An aircraft dispatcher may not release a flight from an aerodrome that is not listed in OpSpec C70, unless the following criteria are met:

- 1) The aerodrome and related facilities are adequate for the operation of the aircraft.
- 2) The operation is in compliance with the limitations of the flight manual and OpSpecs.
- 3) The aircraft has been dispatched according to those rules applicable to dispatch from an approved aerodrome.
- 4) The weather conditions for takeoff are equal to or exceed that prescribed in the OpSpecs.

**4.25.2.15. AMENDMENT OF A DISPATCH RELEASE.** In the absence of an emergency, a flight may only proceed to the destination to which it was originally dispatched, and if the flight is unable to

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land at the original destination, it may only proceed to the designated alternate aerodrome. However, GACAR § 121.1341 allows for a dispatch release to be amended, while the flight is en-route. An amendment may become necessary or desirable because the conditions under which the flight was released have changed (unplanned re-release) or because it may have been planned before departure (a preplanned, re-release).

**A. Destination Weather Requirements While En-Route.** GACAR §121.1353(a) requires that aircraft dispatchers notify PICs of any information on weather and facilities that may affect the safety of flight while flights are airborne. GACAR Part 121 does not prohibit a flight from continuing toward a destination which has gone below landing minimums or one which is forecast to be below landing minimums at the estimated time of arrival (ETA) by a forecast issued after the flight has departed. For example, there may be enough fuel on board to hold overhead the destination until the weather is forecast to improve. GACAR § 121.1345 does, however, prohibit the PIC from continuing to the destination when, in the opinion of either the PIC or the aircraft dispatcher, it is unsafe to do so. POIs should verify that the operators OM provide guidance to both PICs and aircraft dispatchers for dealing with these circumstances.

**B. Alternate Weather Requirements While En Route.** GACAR § 121.1341(a) prohibits the flight from continuing to a destination aerodrome unless the weather conditions at the alternate aerodrome (specified in the dispatch release) are forecast to be at or above the required alternate minimums at the ETA at the alternate aerodrome.

- 1) An alternate aerodrome may be named which is below alternate minimums at the time of release, but which is forecast to be above minimums at the ETA. POIs should verify that the operator's OM contains specific procedures, however, for notifying the PIC and monitoring the weather at the alternate aerodrome when the selected alternate aerodrome is below minimums at departure. These procedures may require the designation of a second alternate aerodrome or that contingency fuel must be carried on the flight.
- 2) Conditions other than ceiling and visibility can affect minimums, such as navigational aids, runway lighting, and snow removal operations. Aircraft dispatchers must monitor these factors at designated alternate aerodromes as well as ceiling and visibility.
- 3) When weather conditions permit, many operators release flights without an alternate aerodrome. In some instances while the flight is en route, the destination weather may deteriorate to below what was used to release the flight and to the point that an alternate

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aerodrome would have been required. The operator's OM should contain direction and guidance to PICs and aircraft dispatchers on how to manage such a situation.

4) The dispatch release may be amended while the aircraft is en-route to include any aerodrome as an alternate that has the following:

- Authorization for that type of aircraft
- Is within the fuel range of the aircraft
- Alternate aerodrome landing weather minimums

**C. Requirements to Amend a Dispatch Release.** GACAR § 121.1341(b) requires that before a destination aerodrome or an alternate aerodrome may be changed, the following requirements must be met:

- The change must be jointly approved by the PIC and the aircraft dispatcher
- The aircraft dispatcher must be thoroughly familiar with reported and forecast weather conditions (including adverse weather) and the status of communications, navigation, and aerodrome facilities
- The aircraft dispatcher must provide the information specified in previous subparagraph 2) to the PIC
- The destination and alternate aerodromes specified in the amended release must be forecast to be above the weather minimums required in the operator's OpSpecs for the destination and alternate aerodromes, respectively, at the ETA
- The aircraft must have sufficient fuel on board at the time and point that the release was amended to complete the flight in compliance with the applicable fuel requirements
- The transmission of the re-dispatch message must be recorded by the aircraft dispatcher, and its receipt must be recorded by the PIC

**D. Planned Re-Dispatch.** Planned re dispatch operations are conducted to conserve fuel, to complete flights at ranges which would otherwise be beyond the aircraft's fuel capacity, and to

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solve weather-related operational problems. A GACAR Part 121 operator may only conduct planned re-dispatch in extended overwater operations when authorized by OpSpec B44 of the operator's OpSpecs.

**NOTE:** Section 3 of this chapter contains a discussion of planned re-dispatch procedures.

### 4.25.2.17. LOAD MANIFESTS.

**A. Preparation of the Load Manifest.** Each operator is responsible for the preparation and accuracy of the load manifest required by GACAR § 121.1517 before each takeoff. The form must be prepared and signed for each flight by employees of the operator who have the duty of supervising the loading of the aircraft and preparing the load manifest forms, or by other qualified persons authorized by the operator who to certify that:

- The load manifest is completed accurately
- The load is distributed and secured in accordance with approved procedures

**B. Content of the Manifest.** A GACAR Part 121 operator must prepare a load manifest containing the following:

- The mass of the aircraft, fuel and oil, cargo and baggage, passengers and crew members
- The maximum allowable mass for that flight
- The total mass computed under approved procedures
- Evidence that the aircraft is loaded according to an approved schedule that ensures that the center of gravity is within approved limits
- Names of passengers, unless such information is maintained by other means by the operator

**C. Disposition of Flight Records.** The PIC must carry the following flight records to the destination aerodrome. The operator must retain these flight records for the period specified in GACAR § 121.1565. The PI must ensure that the operator's storage methods and location provide reasonable access for inspections. These flight records are as follows:

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- Load manifest required by GACAR § 121.1517
- Dispatch release required by GACAR § 121.1509

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#### **CHAPTER 25. OPERATIONAL CONTROL FOR AIR OPERATORS**

##### **Section 3. Part 121 Flight Release Systems**

**4.25.3.1. GENERAL.** This section contains information and guidance to be used by principal operations inspectors (POIs) when evaluating flight release systems utilized by General Authority of Civil Aviation Regulation (GACAR) Part 121 operators. Operators conducting unscheduled operations must have:

- A flight release system as specified in GACAR § 121.1325 and generate flight releases in accordance with GACAR § 121.1509; or
- A dispatch release system

**NOTE:** If a GACAR Part 121 operator conducting unscheduled operations elects to utilize a dispatch release system, follow the guidance found in Section 2 of this chapter.

##### **A. Authority and Responsibility.**

- 1) No flight may be initiated without specific authority from the person authorized by the operator to exercise operational control over the flight.
- 2) No flight can be started unless the pilot in command (PIC) or the person authorized by the operator to exercise operational control over the flight has executed a flight release setting the conditions under which the flight(s) will be conducted. The PIC may sign the flight release only when he and the person authorized by the operator to exercise operational control believe that the flight can be made safely.
- 3) No flight can continue from an intermediate aerodrome without a new flight release if the aircraft has been on the ground more than 6 hours.
- 4) Operational control for each flight must be shared between the PIC and the director of operations (DO). The DO may delegate the authority to perform operational control to other persons as specified in the operations manual (OM).

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5) The operator must ensure that the PIC and each person authorized to exercise operational control has access to the information needed to comply with the requirements of GACAR Part 121 and are able to perform their required duties.

6) Each PIC of an aircraft is responsible for the preflight planning and the operation of the flight in compliance with the GACARs and the applicable operations specifications (OpSpecs).

**B. Preflight Briefing.** GACAR § 121.1353(b) states “Before beginning a flight, each PIC must obtain all available current reports or information on aerodrome conditions and irregularities of navigation facilities that may affect the safety of the flight”. In addition, during a flight, the PIC must obtain any additional available information of meteorological conditions and irregularities of facilities and services that may affect the safety of the flight.

**C. Flight-Monitoring.** Per GACAR § 121.1331, the DO is responsible for:

1) Cancelling, diverting or delaying a flight if in his opinion or the opinion of the PIC the flight cannot operate or continue to operate safely as planned or released

2) Assuring that each flight is monitored with respect to at least the following:

- Departure of the flight from the place of origin and arrival at the place of destination, including intermediate stops and any diversions therefrom
- Maintenance and mechanical delays encountered at places of origin and destination and intermediate stops
- Any known conditions that may adversely affect the safety of flight

3) Each operator must attempt to coordinate operational instructions involving a change in the Air Traffic Service (ATS) flight plan with the appropriate ATS unit before notifying the PIC.

**D. Operations Manual (OM).** PIs must ensure that the operator’s OM contains policies and procedures for releasing flights and subsequent inflight monitoring. GACAR § 121.151 requires that the manual or applicable parts be available to each person authorized to exercise operational during the performance of their duties. POIs must ensure that the operator’s OM includes the

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following information:

- 1) The operator's OM must contain flight crew reporting requirements and the actions that each person authorized to exercise operational should take if reports from the flight crew are not received.
- 2) Once initiated, a flight must continue to destination as planned and in accordance with the conditions of the flight release. A PIC may not continue to destination, however, when in the opinion of either the PIC or the person authorized to exercise operational, it is unsafe to do so. In such cases, the PIC must take action to obtain the concurrence on a new course of action and then amend the release, as applicable.
- 3) ATC frequently delays, re-routes, or assigns altitudes to flights other than those planned by the operator. The ATC system requires this flexibility to re-route traffic flow around adverse weather and to function effectively. The operator's policies and procedures for operational control should accommodate these demands while maintaining the responsibility shared by the person authorized to exercise operational and the PIC.

**NOTE:** GACAR §121.1129(a) authorizes the PIC to deviate from the conditions of the flight release to the extent necessary for safety in an emergency. When the PIC exercises this authority, GACAR § 121.1129(c) requires that the PIC keep both ATC and the person authorized to exercise operational fully informed of the progress of the flight. GACAR §121.1129(c) requires that when emergency authority is exercised, a written report be forwarded within 10 working days to the President, through the DO.

**4.25.3.3. FACILITIES AND STAFFING.** GACAR § 121.1325(b) requires each operator to ensure the number of persons authorized to exercise operational control and the associated facilities are adequate to ensure the flight release requirements of GACAR Part 121 are met for each flight. An operator may contract with other organizations to provide all or part of a flight release system, if authorized by the President.

**4.25.3.5. FLIGHT PREPARATION FORMS.** The PIC must review and accept the following flight preparation forms before commencing a flight:

- The flight release completed in accordance with the requirements of GACAR § 121.1509
- The load manifest completed in accordance with the requirements of GACAR §§ 121.1337

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**NOTE:** If a person other than the PIC prepared the flight release, that person must sign or certify the flight release in a manner acceptable to the President before sending it to the PIC.

**4.25.3.7. PREPARATION OF OPERATIONAL FLIGHT PLAN (OFP).** An operational flight plan must be completed for each flight. The PIC or other person authorized and qualified by the operator must prepare the OFP and include it in the flight release in accordance with GACAR § 121.1509.

**NOTE:** See GACAR § 121.1513 for guidance on the content of the OFP.

**4.25.3.9. FLIGHT RELEASE: WEATHER REQUIREMENTS.** PICs must be informed about the weather requirements for the flight release of any Part 121 flights.

**A. Familiarity.** No PIC may begin a flight unless he is thoroughly familiar with reported and forecast weather conditions on the route to be flown.

**B. Dispatch Under VFR.** GACAR § 121.1365 prohibits any person from releasing an aircraft for VFR operation unless the ceiling and visibility en route, as indicated by available weather reports or forecasts, or any combination thereof, are and will remain at or above applicable VFR minimums until the aircraft arrives at the aerodrome or aerodromes specified in the dispatch or flight release.

**NOTE:** GACAR Part 121 flights may not be dispatched under VFR rules unless they are specifically authorized by Operations Specification (OpSpec) B51.

**C. IFR Takeoff Weather Minimums.** Per GACAR § 121.1389, no person may release a flight when the weather at the departure point is reported to be less than the takeoff minimums specified in OpSpec C56. The weather conditions may, however, be below the landing minimums specified in the operator's OpSpecs for the aerodrome. In this case the flight may not be released unless the following conditions exist:

- 1) For a two-engine airplane, an alternate aerodrome is available, which is not more than one hour from the departure aerodrome at normal cruising speed, in still air, with one engine inoperative.
- 2) For an airplane with three or more engines, an alternate aerodrome is available which is not more than 2 hours from the departure aerodrome at normal cruising speed, in still air, with one engine inoperative.

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3) The alternate aerodrome required by subparagraph 1) or subparagraph 2) must meet the requirements of the operator's OpSpecs.

4) The weather conditions at the designated takeoff alternate at the estimated time of arrival (ETA) meet the requirements of OpSpec C55.

**D. Destination Weather - IFR Operations.** GACAR §121.1369 prohibits the releasing of a flight under IFR or over-the-top rules unless weather reports and/or forecasts indicate that the weather will be at, or above, minimums required in the OpSpecs at the destination aerodrome at the ETA.

**E. Alternate Aerodrome for Destination: IFR or Over the Top.** GACAR §121.1393(b) prohibits any person from releasing a flight under IFR or over-the-top rules unless at least one alternate aerodrome is listed for each destination aerodrome in the flight release and at which the weather exceeds the alternate aerodrome requirements in OpSpec C55. An alternate aerodrome does not have to be designated where the aircraft carries enough fuel to meet the requirements of GACAR § 121.1417 for flights outside the Kingdom of Saudi Arabia (KSA) over routes without an available alternate aerodrome for a particular aerodrome of destination.

**F. Alternate Aerodrome Weather Minimums.** No person may list an aerodrome as an alternate in the flight release unless the appropriate weather reports or forecasts, or any combination thereof, indicate that the weather conditions will be at or above the alternate weather minimums specified in the operator's OpSpecs for that aerodrome when the flight arrives.

**NOTE:** This guidance is not applicable for ETOPS alternate aerodromes (see in GACAR § 121.1401)

**4.25.3.11. FLIGHT RELEASE: FUEL AND OIL SUPPLY.** POIs need to be aware of the fuel requirements for release under GACAR Part 121 rules (see Section 3 of this chapter for fuel requirements in extended overwater operations). The fuel planning provisions found in GACAR § 121.1381 apply to all flights.

**A. Required Fuel Supply.** An operator may not release a flight, and a flight may not take off unless, considering winds and forecast weather conditions, the flight carries all of the required fuel. The President may amend the OpSpecs to require more fuel than any of the required minimums if he finds that the additional fuel is necessary on a particular route in the interest of

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safety.

**NOTE:** The operator's OM should contain policies and instructions to the person exercising operational control and PICs for computing the amount of fuel to be carried under the circumstances likely to be encountered in the operator's specific operation.

**NOTE:** When computing fuel requirements, all fuel must be in addition to unusable fuel.

**B. Departure Fuel.** GACAR § 121.1381 requires the fuel listed in subparagraph A above, be on board the aircraft at takeoff. The flight release must display this amount. The operator's OM should contain a clear statement of this point for pilots, the person exercising operational control and load planners.

**4.25.3.13. FLIGHT RELEASE.** A flight conducted under GACAR Part 121 rules may not depart from the point of origin unless a flight release contains specific authorization for the flight between specified points. The flight release may be for a single flight or for a series of flights with intermediate stops. The flight release form must contain a statement for the PIC to certify all requirements of GACAR § 91.43(b) have been met.

**A. Required Dispatch Release Elements.** POIs must ensure that operators require that flight releases be recorded in writing and contain at least the following information:

- Aircraft identification number / Flight number
- The name of the person preparing the flight release
- The signature(s)/acceptable certification required by GACAR § 121.1313
- Names of the crew members
- ATC flight plan required by GACAR § 91.73
- The OFP contents required by GACAR § 121.1513
- Departure aerodrome, intermediate stops, destination aerodromes, and alternate aerodromes
- The type of operation (IFR or VFR)

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- Minimum fuel quantity required by GACAR § 121.1381

**B. Flight Release - Additional Information and Conditions.** While a flight release must contain the information specified in subparagraphs A above, it is not limited to that information. Additional information and conditions should be placed on or attached to the release. When a flight is planned under conditions which could limit the PIC's discretion, those conditions should be indicated. GACAR §121.1509(b) requires the flight release form contain a statement for the PIC to certify all the requirements of GACAR § 91.43(b) have been met. One acceptable means an operator may use to inform the PIC that there are or are not attachments is to place a statement to this effect on the flight release.

**4.25.3.15. AMENDMENT OF A FLIGHT RELEASE.** In the absence of an emergency, a flight may only proceed to the destination to which it was originally dispatched, and if the flight is unable to land at the original destination, it may only proceed to the designated alternate aerodrome. However, GACAR § 121.1341 allows for a flight release to be amended en route to include any alternate aerodrome within the fuel range of the aircraft as specified in GACAR §§ 121.1381 through 121.1417, as applicable.

**NOTE:** No person may change an original destination or alternate aerodrome specified in the original flight release to another aerodrome while the aircraft is en route unless the other aerodrome is authorized for that type of aircraft and the appropriate requirements of GACAR Part 91 and 121 are met at the time of amendment of the flight release.

**A. Alternate Weather Requirements While En-Route.** GACAR § 121.1341(a) prohibits the flight from continuing to a destination aerodrome unless the weather conditions at the alternate aerodrome (specified in the flight release) are forecast to be at or above the required alternate minimums at the ETA at the alternate aerodrome.

1) An alternate aerodrome may be named which is below alternate minimums at the time of release, but which is forecast to be above minimums at the ETA. POIs should verify that the operator's OM contains specific procedures, however, for notifying the PIC and monitoring the weather at the alternate aerodrome when the selected alternate aerodrome is below minimums at departure. These procedures may require the designation of a second alternate aerodrome or that contingency fuel must be carried on the flight.

2) Conditions other than ceiling and visibility can affect minimums, such as navigational aids, runway lighting, and snow removal operations. The person exercising operational

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control must monitor these factors at designated alternate aerodromes as well as ceiling and visibility.

3) When weather conditions permit, many operators release flights without an alternate aerodrome. In some instances while the flight is en route, the destination weather may deteriorate to below what was used to release the flight and to the point that an alternate aerodrome would have been required. The operator's OM should contain direction and guidance to PICs and the person exercising operational control on how to manage such a situation.

4) The flight release may be amended while the aircraft is en-route to include any aerodrome as an alternate that has the following:

- Authorization for that type of aircraft
- Is within the fuel range of the aircraft
- Alternate aerodrome landing weather minimums

**B. Requirements to Amend a Flight Release.** GACAR §121.1341(b) requires that before a destination aerodrome or an alternate aerodrome may be changed, the following requirements must be met:

- The change must be jointly approved by the PIC and the person exercising operational control
- The person exercising operational control must be thoroughly familiar with reported and forecast weather conditions (including adverse weather) and the status of communications, navigation, and aerodrome facilities
- The person exercising operational control must provide the information specified in previous subparagraph 2) to the PIC
- The destination and alternate aerodromes specified in the amended release must be forecast to be above the weather minimums required in the operator's OpSpecs for the destination and alternate aerodromes, respectively, at the ETA

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- The aircraft must have sufficient fuel on board at the time and point that the release was amended to complete the flight in compliance with the applicable fuel requirements
- The transmission of the re-release message must be recorded by the person exercising operational control, and its receipt must be recorded by the PIC

### 4.25.3.17. LOAD MANIFESTS.

**A. Preparation of the Load Manifest.** Each operator is responsible for the preparation and accuracy of the load manifest required by GACAR § 121.1517 before each takeoff. The form must be prepared and signed for each flight by employees of the operator who have the duty of supervising the loading of the aircraft and preparing the load manifest forms, or by other qualified persons authorized by the operator who to certify that:

- The load manifest is completed accurately
- The load is distributed and secured in accordance with approved procedures

**B. Content of the Manifest.** A GACAR Part 121 operator must prepare a load manifest containing the following:

- The mass of the aircraft, fuel and oil, cargo and baggage, passengers and crew members
- The maximum allowable mass for that flight
- The total mass computed under approved procedures
- Evidence that the aircraft is loaded according to an approved schedule that ensures that the center of gravity is within approved limits
- Names of passengers, unless such information is maintained by other means by the operator

**C. Disposition of Flight Records.** The PIC must carry the following flight records to the destination aerodrome. The operator must retain these flight records for the period specified in GACAR § 121.1565. The POI must ensure that the operator's storage methods and location provide reasonable access for inspections. These flight records are as follows:

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- Load manifest required by GACAR § 121.1517
- Flight release required by GACAR § 121.1509

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### CHAPTER 25. OPERATIONAL CONTROL FOR AIR OPERATORS

#### Section 4. Part 121 Operations Outside the Kingdom of Saudi Arabia (KSA), and Extended Overwater Operations.

**4.25.4.1. GENERAL.** This section contains information and guidance to be used by principal inspectors (PIs) concerning General Authority of Civil Aviation Regulation (GACAR) Part 121 operations outside the Kingdom of Saudi Arabia (KSA), and in extended overwater operations.

**A. Instrument Flight Rule (IFR) and Visual Flight Rule (VFR) Authorizations.** GACAR Part 121 operators must conduct extended overwater operations under instrument flight rules (IFR) unless they show that operating under IFR is not necessary for safety. An authorization to conduct extended overwater operations under VFR rules is seldom granted. When granted, such an authorization is contained in Operations Specifications (OpSpecs) B51 and C77.

**B. Aircraft Limitations on Extended Over Water Operations.** When an aircraft is certified for extended overwater operations, these operations will appear as authorized operations in the limitations section of the approved aircraft flight manual (AFM). A GACAR Part 121 operator may not operate:

- A land airplane in an extended over water operation unless it is certificated for ditching under the ditching provisions of GACAR Part 25
- A rotorcraft in an extended over water operation unless it is certificated for ditching under the ditching provisions of GACAR Part 29

**NOTE:** The President may approve extended over water operations for aircraft that do not meet the requirements above, if he finds the level of safety acceptable for the proposed route of flight.

**4.25.4.3. DESTINATION WEATHER MINIMUMS.** GACAR § 121.1373(a) states the following: “No person may dispatch or release an aircraft for a flight that involves extended overwater operation unless appropriate weather reports or forecasts, or any combination thereof, indicate that the weather conditions will be at or above the authorized minimums at the estimated time of arrival (ETA) at any aerodrome to which dispatched or released or to any required alternate aerodrome.” This regulation

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means that weather conditions must be forecasted to be above the required minimums at the ETA, but the weather conditions do not necessarily have to be above the required minimums at the time of dispatch or release.

**A. Weather Forecasting for Extended Flight Operations.** Extended overwater operations may require flight times of 10 or more hours. Since the certainty of weather forecasts deteriorates as the period of the forecast lengthens, meteorologists usually add conditional phrases to the remarks of these forecasts to alert the users to this uncertainty. Operators may, as a result of these conditional remarks, find it difficult to dispatch or release to the desired destination and to find acceptable alternate aerodromes. Aircraft dispatchers or the person exercising operational control have a number of methods at their disposal, however, to overcome these limitations.

- 1) The installation of CAT II and CAT III approach aids have resulted in destination weather minimums as low as a ceiling of zero and a runway visual range of 175 m. Modern facilities have also resulted in alternate weather minimums authorized by OpSpecs being reduced.
- 2) Operators may release a flight to an intermediate destination and then re-dispatch or re-release the flight to the actual destination while the flight is en-route. The re-dispatch or re-release can be based on current weather reports and short term forecasts.
- 3) A flight movement forecast (FMF) may be used to control flight if it was prepared by a source acceptable to the President.

### 4.25.4.5. ALTERNATE AERODROMES.

**A.** An aircraft may not be dispatched or released for an ETOPS flight unless enough ETOPS alternate aerodromes are listed in the dispatch or flight release so that the aircraft remains within the authorized ETOPS maximum diversion time. In selecting these ETOPS alternate aerodromes, the operator may consider all adequate aerodromes within the authorized ETOPS diversion time for the flight to meet the standards of GACAR Part 121.

**B.** An aerodrome may not be listed as an ETOPS alternate aerodrome in a dispatch or flight release unless, when it might be used (from the earliest to the latest possible landing time):

- The appropriate weather reports or forecasts, or any combination thereof, indicate that the weather conditions will be at or above the ETOPS alternate aerodrome minimums specified in the OpSpecs

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- The field condition reports indicate that a safe landing can be made
- Rescue and Firefighting Services (RFFS) is available at the aerodrome as specified in GACAR § 121.1117(f)

**C.** Once a flight is en route, the weather conditions at each ETOPS alternate aerodrome must meet the requirements of GACAR § 121.1413.

**D.** No person may list an aerodrome as an ETOPS alternate aerodrome in the dispatch or flight release unless that aerodrome meets the public protection requirements of GACAR § 121.77(c) (1)(ii).

### **4.25.4.7. ALTERNATE AERODROMES: CONSIDERING TIME-LIMITED SYSTEMS IN PLANNING.**

**A.** For ETOPS up to and including 180 minutes, an aerodrome may not be listed as an ETOPS alternate aerodrome in a dispatch or flight release if the time needed to fly to that aerodrome (at the approved one engine inoperative cruise speed under standard conditions in still air) would exceed the approved time for the aircraft's most limiting ETOPS significant system (including the aircraft's most limiting fire suppression system time for those cargo and baggage compartments required by regulation to have fire suppression systems) minus 15 minutes.

**B.** For ETOPS beyond 180 minutes, an aerodrome may not be listed as an ETOPS alternate aerodrome in a dispatch or flight release if the time needed to fly to that aerodrome:

- 1) At the all engine operating cruise speed, corrected for wind and temperature, exceeds the aircraft's most limiting fire suppression system time minus 15 minutes for those cargo and baggage compartments required by regulation to have fire suppression systems or
- 2) At the one-engine-inoperative cruise speed, corrected for wind and temperature, exceeds the aircraft's most limiting ETOPS significant system time (other than the aircraft's most limiting fire suppression system time minus 15 minutes for those cargo and baggage compartments required by regulation to have fire suppression systems).

### **4.25.4.9. FLIGHT BEYOND THE ENTRY POINT.**

**A.** A flight may not continue beyond the ETOPS Entry Point unless:

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1) The weather conditions at each ETOPS alternate aerodrome required by GACAR § 121.1401 are forecast to be at or above the operating minimums for that aerodrome in the certificate holder's operations specifications when it might be used (from the earliest to the latest possible landing time).

**NOTE:** If subparagraph 1 above, cannot be met for a specific aerodrome, the dispatch or flight release may be amended to add an ETOPS alternate aerodrome within the maximum ETOPS diversion time that could be authorized for that flight with weather conditions at or above operating minimums.

2) All ETOPS alternate aerodromes within the authorized ETOPS maximum diversion time are reviewed and the flight crew advised of any changes in conditions that have occurred since dispatch or release.

**B.** Before the ETOPS Entry Point, the PIC, using the flight release system or an aircraft dispatcher, using the dispatch release system must use company communications to update the flight plan if needed because of a re evaluation of aircraft system capabilities.

**4.25.4.11. FUEL AND OIL SUPPLY.** An aircraft may not be dispatched or released for an ETOPS flight unless, it has enough fuel and oil to satisfy the requirements of GACAR § 121.271 and the following:

**A. Fuel to fly to an ETOPS alternate aerodrome.**

1) *Fuel to account for rapid decompression and engine failure.* The aircraft must carry the greater of the following amounts of fuel:

a) Fuel sufficient to fly to an ETOPS alternate aerodrome assuming a rapid decompression at the most critical point followed by descent to a safe altitude in compliance with the oxygen supply requirements of GACAR § 91.305.

b) Fuel sufficient to fly to an ETOPS alternate aerodrome (at the one engine inoperative cruise speed) assuming a rapid decompression and a simultaneous engine failure at the most critical point followed by descent to a safe altitude in compliance with the oxygen requirements of GACAR § 91.305.

c) Fuel sufficient to fly to an ETOPS alternate aerodrome (at the one engine inoperative

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cruise speed) assuming an engine failure at the most critical point followed by descent to the one engine inoperative cruise altitude.

2) *Fuel to account for errors in wind forecasting.* In calculating the amount of fuel required by subparagraph A 1) a) above, the operator must increase the actual forecast wind speed by 5 percent (resulting in an increase in headwind or a decrease in tailwind) to account for any potential errors in wind forecasting. If an operator is not using the actual forecast wind based on a wind model, the aircraft must carry additional fuel equal to 5 percent of the fuel required for subparagraph A 1) a) above, as reserve fuel to allow for errors in wind data.

3) *Fuel to account for icing.* In calculating the amount of fuel required by subparagraph A 1) a) above (after completing the wind calculation in subparagraph A 1) b) above, the operator must ensure that the aircraft carries the greater of the following amounts of fuel in anticipation of possible icing during the diversion:

- a) Fuel that would be burned because of airframe icing during 10 percent of the time icing is forecast (including the fuel used by engine and wing anti ice during this period).
- b) Fuel that would be used for engine anti ice, and if appropriate wing anti ice, for the entire time during which icing is forecast.

4) *Fuel to account for engine deterioration.* In calculating the amount of fuel required by subparagraph A 1) a) above, (after completing the wind calculation in subparagraph A 1) b) above), the aircraft also carries fuel equal to 5 percent of the fuel specified above, to account for deterioration in cruise fuel burn performance unless the operator has a program to monitor aircraft in service deterioration in cruise fuel burn performance.

**B. Fuel to account for holding, approach, and landing.** In addition to the fuel required by subparagraph A 1) above, the aircraft must carry fuel sufficient to hold at 1500 ft (460 m) above field elevation for 15 minutes upon reaching an ETOPS alternate aerodrome and then conduct an instrument approach and land.

**C. Fuel to account for APU use.** If an APU is a required power source, the operator must account for its fuel consumption during the appropriate phases of flight.

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### 4.25.4.13. PERFORMANCE LIMITATIONS.

POIs must ensure that operators have complied with

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the performance limitations of GACAR Part 121, Subpart F. Some performance limitations follow:

- A.** The flight must be planned so that the aircraft is not too heavy to land at the intermediate destination or alternate aerodrome, in accordance with GACAR §§ 121.275 and 121.279, as applicable. The operator may select a re-dispatch or re-release point beyond the intermediate destination to meet this requirement rather than selecting a point short of the intermediate destination, as is usually done when aircraft mass is not a factor.
- B.** The operator must comply with the applicable en-route, engine out performance requirements of GACAR §§ 121.267 and 121.271, which can limit the dispatch or release mass of the aircraft.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 25. OPERATIONAL CONTROL FOR AIR OPERATORS**

##### **Section 5. Part 135 Flight Locating Systems**

**4.25.5.1. GENERAL.** This section contains direction and guidance to be used by principal operations inspectors (POIs) concerning General Authority of Civil Aviation Regulation (GARAR) Part 135 flight-locating systems and operating rules. POIs should use this section along with Section 1 of this chapter when reviewing an operator's Operations Manual (OM) and when conducting inspections of GACAR Part 135 operators.

**4.25.5.3. GENERAL REQUIREMENTS.** Although GACAR § 135.585 requires that each operator exercise operational control, the method by which an operator does so is not closely defined. POIs must ensure that each operator's system provides adequate control of the operation being conducted and should be aware of the following requirements regarding operational functions:

###### **A. Responsibility for Operational Control.**

- 1) Each GACAR Part 135 operator is responsible for operational control.
- 2) The PIC and the aircraft dispatcher, when applicable, are jointly responsible for the preflight planning, delay, and dispatch release of a flight in compliance with GACAR Part 135 and operations specifications (OpSpecs).
- 3) Each operator must list, in the operations manual (OM) required by GACAR § 135.85, the name and title of each person authorized by it to exercise operational control.
- 4) Each PIC of an aircraft is, during flight time, in command of the aircraft and crew and is responsible for the safety of the passengers, crew members, cargo, and aircraft.
- 5) Each PIC has full control and authority in the operation of the aircraft, without limitation, over other pilots and their duties during flight time.
- 6) No pilot may operate an aircraft in a careless or reckless manner so as to endanger life or property.

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### **B. Maintaining Operational Control.**

- 1) Maintaining operational control of flights and providing flight locating functions are two distinct responsibilities of each GACAR Part 135 operator. Flight locating requires procedures by the operator to locate each flight for which a flight plan is not filed. Having a sufficient flight locating system does not mean that the GACAR Part 135 operator is properly maintaining operational control the flight. Operational control also requires that an operator has the knowledge to make those decisions perform those actions on an ongoing basis that are necessary to operate flights safely and in compliance with the regulations, and be held accountable for those decisions and actions.
- 2) Maintaining operational control requires the GACAR Part 135 operator to, among other things:
  - a) Ensure that it alone conducts operations authorized in its OpSpecs.
  - b) Ensure that only its crew members that are trained and qualified in accordance with the applicable regulations and the certificate holder's approved training program, are assigned to conduct a flight in accordance with the limitations in GACAR § 135.333.
  - c) Before initiation of a flight or series of flights, know the identity of each crew member and affirmatively determine that the crew member is qualified to function as a required crew member on the flight. Absent such knowledge and determination, the air operator must not assign a crew member to a flight or series of flights.
  - d) Ensure that all of its crew members are in compliance with all applicable flight, duty, and rest requirements before assigning the crew members to a flight.
  - e) Designate a PIC for each flight before the flight commences.
  - f) Specify the conditions under which a flight may be operated, such as determining weather minimums, proper aircraft loading, center of gravity limitations, icing conditions, and fuel requirements.
  - g) Put procedures in place to ensure that when safety conditions specified for a flight cannot be met, the flight is canceled, delayed, rerouted, or diverted.

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- h) Ensure that an aircraft is airworthy and is in compliance with the conditions and limitations specified by the approved inspection/maintenance program for the certificate holder before it is allowed to depart on a flight.
- i) Have a system for locating each flight if a flight plan has not been filed.

**B. Flight Releases.** Per GACAR § 135.647, no person may start a flight unless the PIC or the person authorized by the operator to exercise operational control over the flight has executed a flight release setting forth the conditions under which the flight will be conducted. The PIC may sign the flight release only when both the PIC and the person authorized to exercise operational control believe the flight can be made safely, unless the PIC is authorized by the operator to exercise operational control and execute the flight release without the approval of any other person. In addition:

- 1) No person can continue a flight from an intermediate aerodrome without a new flight release if the aircraft has been on the ground more than 6 hours.
- 2) Each operator must attempt to coordinate operational instructions involving a change in the Air Traffic Service (ATS) flight plan with the appropriate ATS unit before notifying the PIC.

**C. Operations Manual Requirements.** POIs of GACAR Part 135 operators should ensure that the operator's OM contains procedures that accomplish the following:

- Inform the PIC of the required information contained in ATC stored flight plans that ensure compliance with GACAR § 91.185(a)
- Ensure compliance with GACAR § 135.658 fuel supply requirements
- Ensure compliance with GACAR §§ 135.145 and 135.657(b), and applicable GACAR Part 135, Subpart F performance requirements
- Ensure compliance with GACAR §§ 135.657, 135.663 and § 135.667 alternate requirements
- Familiarize PICs with all available information required by GACAR § 91.43

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**D. Load Manifests.** GACAR §135.690(a) requires that a load manifest be kept on board for all flights. The load manifest must contain the following:

- Number of passengers
- Total mass of the loaded aircraft
- Maximum allowable takeoff mass for that flight
- Center of gravity (CG) limits of the loaded aircraft
- CG or an acceptable entry from an approved schedule
- Flight number or registration marks
- Origin and destination of flight
- Identification of all crew members and their position assignments

**4.25.5. FLIGHT-LOCATING SYSTEMS.** GACAR § 135.599 requires that each operator have procedures established for locating each flight, for which a flight plan is not filed. The operator must furnish the General Authority of Civil Aviation (GACA) with a copy of its flight locating procedures and any changes or additions, unless those procedures are included in the OM. Flight locating information must be retained at the operator's principal place of business, or at other places designated by the operator in the flight locating procedures, until the completion of the flight. The flight locating system must:

- Provide the operator with at least the information required to be included in a VFR flight plan
- Provide for timely notification of an Air Traffic Services facility or search and rescue facility, if an aircraft is overdue or missing
- Provide the operator with the location, date, and estimated time for re-establishing communications, if the flight will operate in an area where communications cannot be maintained

**A. Flight Plans Filed by PICs.** GACAR Part 135 operators may require PICs to file and activate air traffic control (ATC) flight plans as one means of complying with GACAR § 135.599. In this

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case, the operator's OM must prohibit the PIC from operating without an activated flight plan until arrival at the destination aerodrome. Operators may find that requiring the PIC to file a flight plan to satisfy the requirements of GACAR § 135.599 preclude certain operations. For example, it is impractical for a PIC to conduct a flight to a non-controlled field by cancelling instrument flight rules (IFR) at the last radio navigation fix and then proceeding under visual flight rules (VFR) to destination on a VFR flight plan. ATC does not accept composite IFR/VFR flight plans. Normally, ATC will not activate a VFR flight on an air traffic control frequency. A PIC who cancels IFR and then changes to a flight-watch frequency to activate a VFR flight plan is not in compliance with § 135.599. One acceptable means an operator may use to comply with GACAR § 135.599 are to require the PIC to telephone the person exercising operational control upon arrival at a destination not served by an ATC facility.

**B. Personnel.** Each operator is responsible for operational control and must list, in the OM, the name and title of each person authorized by it to exercise operational control.

**C. Training.** Operators are responsible for ensuring that individuals authorized to exercise operational control are adequately trained to perform their assigned duties.

**4.25.5.7. FUEL AND OIL SUPPLY.** The fuel and oil planning requirements of GACAR Part 91 and 135 are as follows:

**A. Reciprocating-Engine-Powered Airplanes: VFR Operations.** GACAR §91.161(a) prohibits takeoff in a reciprocating-engine-powered airplane under VFR rules unless the airplane has enough fuel to fly to the aerodrome of first intended landing. Thereafter the airplane must have enough fuel (computed at normal cruise) to either fly for 30 minutes during the day or for 45 minutes at night.

**B. Reciprocating-Engine-Powered Rotorcraft: VFR Operations.** GACAR § 91.161(b) prohibits takeoff in a reciprocating-engine-powered rotorcraft under VFR rules unless the rotorcraft has enough fuel to fly to the aerodrome of first intended landing, and then to fly for 20 minutes at normal cruising fuel consumption.

**C. Reciprocating-Engine-Powered Airplanes: IFR Operations.** GACAR §91.181 prohibits takeoff in a reciprocating-engine-powered airplane in IFR conditions unless the airplane has enough fuel to complete the flight to the aerodrome of first intended landing. Thereafter, the airplane must have enough fuel to fly to the alternate aerodrome, and then to fly for 45 minutes at normal cruise fuel consumption.

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**D. Reciprocating-Engine-Powered Rotorcraft: IFR Operations.** GACAR § 91.181 prohibits takeoff in a rotorcraft in IFR conditions unless the reciprocating-engine-powered rotorcraft has enough fuel to complete the flight to the aerodrome of first intended landing. Thereafter, the rotorcraft must have enough fuel to fly to the designated alternate aerodrome, and then to fly for 30 minutes at normal cruise fuel consumption.

**E. Turbine-Engine-Powered Aircraft.** No person may operate a turbine-engine-powered aircraft unless the fuel requirements of GACAR §§ 121.1381(b) through (f) are met.

**F. Contingency Fuel.** GACAR Part 135 does not specifically require a specific increment of contingency fuel. GACAR § 91.43, however, does require that such contingencies be considered in preflight planning. Therefore, an increment of fuel to compensate for foreseeable contingencies must be on board for takeoff. One such contingency would be a delay in receiving takeoff clearance at major terminals. The operator's OM should contain specific policies and instructions for computing the amount of contingency fuel to be carried under the circumstances likely to be encountered in the operator's specific operation.

**G. En-Route Requirements.** The fuel planning requirements discussed in subparagraphs A through F above apply for takeoff. GACAR Part 135 does not specify the action the PIC must take if an alternate aerodrome goes below minimums when the flight is en-route, or how much fuel must be on board when the flight arrives overhead a destination or alternate aerodrome. GACAR § 135.591(b) allows a PIC to continue toward a destination when a hazard to safe operations may reasonably be expected to be corrected before arrival. GACAR § 135.591(b) does prohibit a PIC from continuing a flight toward a destination, however, when the operator or the PIC knows of conditions that make continuation of the flight hazardous. The operator's OM should contain specific policies and instructions on how the PIC is to proceed in foreseeable circumstances that may be encountered in the operator's specific operation.

**4.25.5.9. WEATHER REQUIREMENTS.** GACAR § 135.659 requires that weather reports and forecasts used in Part 135 operations be prepared by a source authorized by the President under GACAR Part 179 (operations within the Kingdom of Saudi Arabia (KSA)) or a foreign source acceptable to the President (operations conducted outside the KSA). POIs should ensure that GACAR Part 135 operators are conducting operations in compliance with GACAR weather provisions, as follows:

**A. VFR Operations.** A flight may not depart under VFR rules unless the ceiling and visibility en

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route are forecast to be above the applicable VFR minimums until the aircraft arrives at the destination aerodrome.

- 1) All available reports and forecasts must show that the flight can be completed in visual meteorological conditions. Available reports include pilot weather reports, which must be obtained and used when available.
- 2) When there is no information available from an approved source, GACAR § 135.659(b) authorizes PICs to use their own observations or those of another competent person for operations under VFR. This authority is limited to only those situations in which a report from an approved source is not available. For example, these procedures might be appropriate for floatplane operations at remote lakes where no weather observer is stationed. This provision does not relieve PICs and operational control personnel from obtaining and using the information that is available, such as area forecasts and pilot reports.
- 3) The operator's OM must specify the circumstances under which PICs may use the provision of GACAR § 135.659(b). If observers other than PICs are used, operators must specify the training and qualifications of these observers.

### **B. Point of Departure—IFR Operations**A flight may not be originated when the weather at the departure point is below that specified in the applicable OpSpec.

- 1) Takeoff weather minimums may be below the authorized landing minimums. For takeoff in such conditions, an alternate aerodrome must be available, within one hour of flying time from the departure aerodrome at normal cruise speed.
- 2) Operators may be authorized to use “lower-than-standard” takeoff minimums by OpSpec C57. POIs, operators, and PICs must be aware of the limitations associated with this authority. The operator must have an approved “lower-than-standard takeoff” training program and qualification module. The PIC (and second in command (SIC), (when applicable) must have satisfactorily demonstrated competency on their last competency check or instrument proficiency check. A single pilot may not conduct lower-than-standard takeoffs in weather conditions below Category I (CAT I) landing minimums.

### **C. Destination Weather—IFRA**A flight may not depart under IFR or over-the-top rules unless appropriate weather reports or forecasts indicate that conditions will be at or above the minimums required by the OpSpecs at the destination aerodrome at the estimated time of arrival

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(ETA). The reports or forecasts used must be the most currently available at the time of takeoff.

**D. Designation of Alternate Aerodromes.** GACAR § 91.185 specifies when an alternate aerodrome is required for IFR operations or over-the-top operations. An alternate aerodrome does not have to be designated when:

- 1) *For airplanes.* For at least 1 hour before and for 1 hour after the estimated time of arrival, the ceiling will be at least 2000 ft (600 m) above the aerodrome elevation and the visibility will be at least 5 km.
- 2) *For rotorcraft.* At the estimated time of arrival and for 1 hour after the estimated time of arrival, the ceiling will be at least 1000 ft (300 m) above the aerodrome elevation, or at least 400 ft (120 m) above the lowest applicable approach minimums, whichever is higher, and the visibility will be at least 3200 m.

**E. IFR alternate aerodrome weather minimums.** Unless otherwise authorized, no person may include an alternate aerodrome in an IFR flight plan unless appropriate weather reports or weather forecasts, or a combination of them, indicate at the estimated time of arrival at the alternate aerodrome, the ceiling and visibility at that aerodrome will be at or above the following weather minimums:

- 1) If an instrument approach procedure has been published for that aerodrome, the following minimums:
  - a) *For airplanes.* The alternate aerodrome minimums specified in that procedure, or if none are specified the following standard approach minimums:
    1. Precision and approach with vertical guidance (APV) approach procedure: Ceiling 600 ft (180 m) and visibility 3200 m.
    2. Non-precision approach procedure: Ceiling 800 ft (240 m) and visibility 3200 m.
  - b) *For rotorcraft.* Ceiling 200 ft (60 m) above the minimum altitude for the approach to be flown, and visibility at least 1500 m but never less than the minimum visibility for the approach to be flown, and

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2) If no instrument approach procedure has been published for the alternate aerodrome, the ceiling and visibility minimums are those allowing descent from the minimum en-route altitude (MEA), approach, and landing under basic VFR.

**4.25.5.11. IFR CARRYING PASSENGERS IN OVER-THE-TOP OPERATIONS.** GACAR Part 135 contains a set of rules that limit IFR passenger-carrying, over-the-top flights. These limitations do not apply to cargo-only flights.

**NOTE:** GACAR § 135.145 does not prohibit a pilot from operating an aircraft in VFR conditions on an IFR clearance. An aircraft must be IFR equipped and the pilot or pilots must be qualified according to GACAR Part 135 before an IFR clearance may be requested or IFR weather conditions are entered.

**A. Operation of Single-Engine Aircraft in Over-The-Top Operations.** GACAR § 135.145 prohibits the operation of single-engine aircraft carrying passengers (airplanes and rotorcraft) in over-the-top operations unless the following conditions can be met:

- 1) If a ceiling exists, VFR conditions must be forecast to exist under the ceiling along the planned route from the time the flight begins operating over-the-top until one hour after the flight is estimated to reach the destination.
- 2) At all points along the route, upon reaching destination, and for one hour thereafter, the forecast must show that the flight will be able to descend in VFR conditions (clear of clouds), should an engine fail.

**B. Operation of Multiengine Aircraft in IFR, Over-The-Top, Passenger-Carrying Operations.** A multi-engine aircraft (airplane or rotorcraft) may be released for IFR or VFR over-the-top, carrying passengers under the following circumstances:

- 1) The flight may be operated under the conditions described in subparagraphs 1) and 2) above, *or*;
- 2) The operator may limit the takeoff mass so that the aircraft can climb at 50 feet per minute at the minimum en route altitude (MEA) of the route to be flown or at 5,000 ft. (1500 m) mean sea level (MSL), whichever is higher, with the critical engine inoperative. Passenger-carrying, multiengine rotorcraft flying offshore may be started when the rotorcraft can climb at 50 feet per minute at the MEA or 1500 ft. (450 m) MSL, whichever is higher, with the

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critical engine inoperative.

3) A flight may start when weather forecasts and reports indicate that the flight will be able to operate in VFR conditions until it reaches the destination and then descend in VFR conditions to beneath the ceiling. Conditions at the destination must allow a VFR descent for the period of the ETA to one hour after ETA. While operating over-the-top, the flight must be able to comply with subparagraphs B1) or B2).

**4.25.5.13. OVERWATER, PASSENGER-CARRYING OPERATIONS.** Except for takeoffs, landings, and operations within gliding distance of land, aircraft carrying passengers operated over water must be operated as follows:

**A. Multi-engine Airplanes.** Operators must limit the takeoff mass of an airplane so that it can climb at 50 feet per minute at an altitude of 1000 ft (300 m) above ground level (AGL) with the critical engine inoperative.

**B. Rotorcraft.** Rotorcraft must be equipped with flotation devices.

**4.25.5.15. PART 135 EXTENDED OVERWATER OPERATIONS.** Although GACAR Part 135 does not specifically address the requirements for extended overwater operations, GACAR § 135.81(b) requires that each operator develop a manual establishing the policies and procedures for operations that are acceptable to the President. One means, but not the only means, that a GACAR Part 135 operator may use to develop acceptable extended overwater operations procedures is to show compliance with those portions of GACAR Part 121 that correspond to the operation conducted.

**A. Flight Planning and Navigation.** Flight planning and navigational requirements do not differ from those of GACAR Part 121 operators conducting operations in the same airspace (see Sections 1 and 4 of this chapter).

**B. Fuel Planning.** The operator must provide adequate procedures for compensating with the limitations of forecast winds. One acceptable means an operator may use is to comply with the requirements of GACAR § 121.1381.

**C. Engine Out En-Route Performance Limits.** The operator must develop procedures to comply with the engine out performance limitations of GACAR Part 135, Subpart F. The operator's analysis must show compliance at the most critical point on the route. Under most conditions, engine out operations require drift down procedures. POIs must ensure that the operator's

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analysis considers how oxygen and aircraft systems are affected by engine loss.

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#### **CHAPTER 26. EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS FOR PARTS 121 AND 125**

##### **Section 1. General**

###### **4.26.1.1. GACA ACTIVITY REPORT (GAR).**

A. 3308 (AW)

**4.26.1.3. OBJECTIVE.** This chapter provides guidance for conducting General Authority of Civil Aviation Regulation (GACAR) Part 121 and 125 emergency evacuation and ditching demonstrations.

**NOTE:** For the purpose of this chapter, the term “emergency evacuation”, will be addressing a partial emergency evacuation, per the GACARs.

###### **4.26.1.5. GENERAL.**

C. Per GACAR § 121.213 and 125.189, operators must conduct a partial aborted takeoff evacuation demonstration for any airplane with a seating configuration of more than 44 passenger seats. In addition Part 121 and 125 operators must conduct a ditching demonstration for any land aircraft intended for extended overwater operations. These demonstrations specifically test the following areas:

- The operator’s emergency training program and crew member competency
- The operator’s emergency evacuation and ditching procedures
- The reliability and capability of the emergency equipment on the airplane

D. In addition to the demonstrations required by GACAR Parts 121 and 125, aircraft manufacturers must conduct simulated full emergency evacuation demonstration in accordance with GACAR §§ 25.803 and 29.803. This demonstration tests the following:

- The basic aircraft design and the efficiency with which passengers can be safely evacuated

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- The emergency evacuation systems on the aircraft
- The manufacturer's emergency evacuation procedures

**E.** The planning, conduct, observation, evaluation and reporting of an operator's partial emergency evacuation and ditching demonstration are outlined throughout the sections in this chapter.

**4.26.1.7. REGULATORY REQUIREMENTS.** GACAR § 121.213, 121.217, 125.189 and 125.190 specify the requirements for conducting partial emergency evacuation and ditching demonstrations. When they must be performed, how they are to be conducted, and the specific criteria which the operator or manufacturer must meet. These regulations specify the following types of evacuation demonstrations:

- Partial aborted takeoff
- Simulated ditching

**NOTE:** For the purposes of Part 121 or Part 125 emergency evacuation demonstration requirements, the terms "capacity" and "configuration" have the same meaning with respect to passenger seating.

**A. Emergency Evacuation Demonstration.** The following conditions require an emergency evacuation demonstration:

- 1) When an operator takes delivery of a new type/ model of aircraft in passenger carrying operations.
- 2) When an operator proposes to "significantly change" the number of cabin crew members, their seating location, their evacuation duties, or emergency procedures. "Significant change" is a determination made by the Principal Operations Inspector (POI).
  - a) *Number.* A change in the number of required cabin crew members requires an evacuation demonstration. The minimum number of cabin crew members (sometimes referred to as required cabin crew members) is stipulated in the operator's operations specifications (OpSpecs). The need for an evacuation demonstration is based solely on a change in the number of "required" cabin crew members that were used in the former

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evacuation demonstration for that type and model of aircraft by that operator. When a change in seating configuration requires the addition of cabin crew members required by GACAR §§ 121.753(a) and 125.339(a) or allows the reduction of cabin crew members, a partial demonstration is required if that operator has not previously demonstrated that seating capacity with that complement of cabin crew members. A change in seating capacity which does not result in the addition of a required cabin crew member usually does not constitute a “significant change” and a partial demonstration usually is not required. In addition, if there is a reduction in the seating capacity but the operator does not wish to operate the aircraft with a reduction in the number of cabin crew members, a partial demonstration is not required. In some cases, however, depending on changes in cabin crew member duties and/or procedures, a change in the seating capacity which does not result in the addition or reduction of cabin crew members may require an evacuation demonstration.

b) *Location.* When an operator proposes to change a cabin crew member seating assignment for any reason, the POI, must consider if that action significantly changes the cabin crew member’s duties and/or responsibilities. For example, changing a cabin crew member seating assignment from one floor-level exit to an adjacent floor-level exit may not constitute a “significant change” in cabin crew member duties. However, if an operator changes the seating location because of a new procedure which requires, for the first time, cabin crew members to open overwing window exits, that action would constitute a “significant change” and would require a partial demonstration.

c) *Duties and Procedures.* When an operator proposes to change emergency evacuation duties or procedures, the POI, must consider the scope and character of the change in determining the requirement for a partial evacuation. If the degree of change requires cabin crew member actions or knowledge which has never been previously required or demonstrated, a partial demonstration is required. If the change in duties or procedures is minor or can adequately be dealt with through the operator’s training program, a demonstration may not be required. Most of the time, changes in cabin crew member duties will constitute a significant change, for example, if a cabin crew member will now be required to open two doors instead of one door, or if a cabin crew member position has a new exit responsibility at the overwing exits.

- 3) When an operator proposes to “significantly change” the number, location, type of emergency exits, or type of opening mechanism on emergency exits available for evacuation.
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- a) A change in the number of exits is usually not a significant change especially if the exits are all the same type as other exits and are located in the same area. For example, if the variant airplane has two pairs of overwing exits instead of one pair, this would not be a significant change if all the exits were of the same type and operated the same way.
  - b) A change in the location of exits could be a significant change, but usually is not. If the exits are the same identical type and the only change in location is several feet, this might not be a significant change.
  - c) Evaluation of training and procedures is one of the reasons for conducting the evacuation demonstrations. A change in the opening mechanism of an exit is a significant change and an evacuation demonstration should be required so that the General Authority of Civil Aviation (GACA) may assess training on the new opening mechanism.
- 4) Whenever an operator proposes to make one of the changes previously discussed, the POI must consider cabin crew member knowledge, experience, and the operator's training program in determining the degree and significance of the change. The increase in complexity of the duties for each cabin crew member in terms of additional exits, seats, or briefing responsibilities should also be considered.

**NOTE:** The maximum number of passenger seats for a specific transport category aircraft used in GACAR Part 121 or 125 operations is listed in the Type Certificate Data Sheet (TCDS) for each type of aircraft.

**NOTE:** All determinations about significant changes and the need for an evacuation demonstration will be made by the POI.

- 5) GACAR §§ 121.213(b) and 125.189(b) specify the criteria used for evaluating an evacuation demonstration. The operator must demonstrate the effectiveness of its crew member emergency training and evacuation procedures by accomplishing the following:

- Conducting a demonstration without passenger participants using the operator's line operating procedures
- Using company cabin crew members who have completed the approved training program for the type and model of aircraft being demonstrated

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- Opening 50 percent of the required floor-level emergency exits
- Opening 50 percent of the required non-floor-level emergency exits
- Deploying 50 percent of the exit-slides, so that the exits and slides, are “ready for use” within 15 seconds

**NOTE:** Failure to open all exits selected by the GACA will constitute a failure of the demonstration.

6) The following information should be considered when defining the term “ready for use”:

- a) Floor level exits with slides are defined as “ready for use” when the exit is fully opened and the emergency exit slides are completely deployed or inflated and properly positioned in a manner which would not impede passenger or crew member egress. The inflation cylinder may still be making a hissing sound and the slide may not actually touch the ground until the first passenger uses the slide. Neither one of these situations would prevent the slide from being “ready for use.”
- b) Floor level exits with stairs are defined as “ready for use” when the exit is fully opened, the stairs are fully extended, and the bottom of the stairs is within six inches of the ground.
- c) Exits not equipped with a means of escape present some different considerations when defining “ready for use.” In this case, it is important for the POI to determine what the operator’s procedures are and to use those company procedures to define when the exit is “ready for use.” For example, in the case of an overwing exit, the crew member must simulate placement of the hatch in accordance with airline procedures. In the case of a floor level plug/hatch on some smaller aircraft, this might mean that the hatch falls out of the aircraft and lands directly under the door sill.

**B. Ditching Demonstration.** Per GACAR §§ 121.217 and 125.190, Part 12 and 125 operators operating or proposing to operate one or more land aircraft in extended over-water operations must show, by simulated ditching, that it has the ability to carry out its ditching procedures efficiently.

1) GACAR §§ 121.217(b) and 125.190(b) specify the criteria used for evaluating a ditching

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demonstration. The operator must demonstrate the effectiveness of its crew member emergency training and ditching procedures by the following criteria:

- a) The demonstration must assume that daylight hours exist outside the aircraft and that all required crew members are available for the demonstration.
- b) If the operator's manual requires the use of passengers to assist in the launching of life rafts, the necessary passengers must be aboard the aircraft and participate in the demonstration according to the manual.
- c) After the ditching signal has been received, each evacuee must don a life preserver according to the operator's manual.
- d) Each life raft must be removed from stowage, one life raft is launched and inflated (or one slide raft is inflated) and crew members assigned to the inflated life raft display and describe the use of each item of required emergency equipment.
- e) The life raft or slide raft to be inflated will be selected by the President.

**NOTE:** GACAR Part 1 § 1.1 defines “extended-overwater operations” as:

- *Aircraft.* An operation over water at a horizontal distance of more than 50 nautical miles from the nearest shoreline
- *Rotorcraft.* An operation over water at a horizontal distance of more than 50 nautical miles from the nearest shoreline and more than 50 nautical miles from an off-shore heliport structure

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## VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION

### CHAPTER 26. EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS FOR PARTS 121 AND 125

#### Section 2. Aborted Takeoff Emergency Evacuation Demonstration

**4.26.2.1. ABORTED TAKEOFF DEMONSTRATION - PHASE ONE.** The regulatory requirements previously outlined in this chapter identify when a General Authority of Civil Aviation Regulation (GACAR) Part 121 or 125 operators must conduct a partial emergency evacuation demonstration. Typically, this evacuation demonstration is conducted by demonstrating an aborted takeoff.

#### 4.26.2.3. BRIEFING THE OPERATOR ON EVACUATION DEMONSTRATION

**REQUIREMENTS.** When the principal operations inspector (POI) determines an evacuation demonstration is required, the operator must develop a plan outlining the manner in which the demonstration is to be conducted. The POI must meet with the operator as often as necessary to ensure the operator clearly understands which documents and information are required for the plan to be accepted for evaluation.

**4.26.2.5. THE OPERATOR'S PLAN.** GACAR §§ 121.213(b)(2) and 125.189(b)(2)), require the operator to obtain General Authority of Civil Aviation (GACA) approval before conducting the emergency evacuation demonstration. The operator should submit the plan as far in advance as possible. However, GACA policy is that the plan must be submitted at least 15 working days in advance of the demonstration. The operator's plan shall contain the following information:

A. A letter of request which states the following:

- 1) The applicable regulation (GACAR § 121.213 or 125.189), which requires an emergency evacuation demonstration be conducted.
- 2) The aircraft type and model and full seating capacity (including crew members) to be demonstrated.
- 3) The number of cabin crew members and their duty assignment positions to be used during the demonstration.
- 4) The proposed date, time, and location of the evacuation demonstration.

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- 5) The name and telephone number of the company's evacuation demonstration coordinator (spokesman).
- 6) A clear description of how the operator proposes to initiate the demonstration, the signal to be used for the purpose of timing, and how the operator intends to block exits which are not to be used, must also be in the plan. The operator must understand that the signal has to be given to both cabin and ground personnel simultaneously to initiate the demonstration. It should be emphasized that the operator is responsible for developing the initiation procedure and the method for blocking exits. The POI will thoroughly review this procedure for adequacy.

**B.** A diagram, representative of the aircraft to be demonstrated, which includes the following:

- 1) The location and designation of all exits by type and the designated exit pairs.
- 2) The assigned seating location of each required crew member during takeoff.
- 3) The interior cabin configuration showing the location of each passenger seat, the galleys, aisles, lavatories, and passenger compartment partitions and bulkheads.
- 4) Location and type of emergency and safety equipment on the aircraft including, but not limited to:
  - Fire extinguishers
  - Portable oxygen bottles/masks
  - Megaphones
  - Crash axes
  - Emergency ropes/tapes
  - Life rafts/slide rafts/emergency stairs
  - Individual flotation devices or life preservers

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- First aid and emergency medical kits and protective gloves
- Protective Breathing Equipment (PBE)
- Automated External Defibrillator (if applicable)
- Emergency Medical Kits (if applicable)
- Survival Kits (if applicable)
- Flashlights
- Door Warning Flag (door arm strap, if applicable)
- Signaling Devices (overwater)
- Survival Radios (overwater)
- Door Restraining/Barrier Strap (if applicable)

**C.** Copies of the appropriate crew member operations manual (OM) pages describing emergency evacuation duties and responsibilities.

**D.** A copy of the passenger safety information briefing card which will be used on the aircraft.

**E.** A description of the emergency equipment installed on the aircraft including at least the type and model of each item of equipment, as applicable.

**F.** A list of crew members (both flight deck and cabin), who are or will be qualified to participate in the demonstration must be in the operator's plan. The flight crew member must be qualified in the aircraft to be used however; the initial operating experience requirement need not be completed. Cabin crew member personnel (in accordance with GACAR § 121.213(b)(3)) must have completed an approved training program for the type and model of aircraft being demonstrated. Cabin crew members designated by the GACA to participate in the demonstration shall not be provided emergency training or aircraft emergency equipment familiarization more than that specified in the operator's approved training program before the demonstration.

**NOTE:** The flight crew member must take no active role in assisting others inside the cabin

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during the demonstration.

**G.** A description must be in the plan of how the operator will ensure the demonstration is conducted in the “dark of the night,” or in conditions which simulate the “dark of the night.” The regulations do not define “dark of the night.” For the purpose of emergency evacuation demonstrations, “dark of the night” means a level of illumination that approximates the natural illumination that occurs 90 minutes after official sunset under clear sky conditions. This lower level of illumination is needed to properly evaluate the airplane’s emergency lighting system and passenger and crew member performance in darkened conditions. Levels of illumination significantly darker can interfere with a proper evaluation of the demonstration. Therefore, this approximate level of illumination should be maintained by natural or artificial means. The most effective way of controlling the level of illumination is to conduct the demonstration in a darkened hangar. Although GACAR § 121.213 and 125.189, provides information regarding the demonstration, it does not specifically require “dark of the night” conditions. It is GACA policy that such conditions are required for evaluating the aircraft’s emergency lighting system and the performance of the crew members in a darkened environment. The use of window shades in the down or partially lowered position could also be effective in achieving the objective of “dark of the night” in the cabin by preventing exterior lighting from entering the cabin. The combination of the interior cabin lights set to simulate a night-time departure in conjunction with the window shades in the down or partially lowered position may provide a more definitive indication of the activation of the cabin interior emergency lights and the commencement of the demonstration drill. Additionally, window shades in the down or partially lowered position could maintain cabin crew member concentration inside the aircraft and prevent observation of pre-demonstration activities outside the aircraft. The use of window shades in the down or partially lowered position should not conflict with established operator procedures on the position of window shades for the demonstration drill. For example, if there are no windows at the exit and the carrier has established a procedure of having window shades in the open or up position for takeoff and landing because that cabin configuration is needed to provide a means for cabin crew member assessment duties, in that case the demonstration should replicate that cabin configuration. The POI lead should exercise good judgment if the window shades are to be placed in the down or partially lowered position for the demonstration drill.

**H.** A description of how the operator plans to ensure that the aircraft is positioned in a location, either indoors or outdoors, which will allow the unobstructed deployment of all emergency stairs, evacuation slides or slide rafts, as applicable.

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**4.26.2.7. THE ABORTED TAKEOFF DEMONSTRATION - PHASE TWO.** When the operator's emergency evacuation demonstration plan is submitted, the POI must make a cursory review of the submission to ensure all the required information and documents discussed in phase one are included. While a thorough analysis of the submission is conducted during Phase Three, the POI should respond to the operator's plan in a timely manner. Minor omissions or deficiencies can often be resolved by contacting the company's evacuation demonstration coordinator. If discrepancies can be resolved quickly, the process moves to Phase Three. If the operator's plan has a significant number of required items or documents missing or is obviously incomplete, the entire submission must be returned to the operator with a written explanation of why it is unacceptable. The operator shall be advised that the GACA will take no further action until an acceptable plan is submitted.

**4.26.2.9. THE ABORTED TAKEOFF DEMONSTRATION - PHASE THREE.** During Phase Three the POI should conduct a thorough analysis and evaluation of the operator's plan.

**A.** The POI must ensure that the information in or attached to the operator's letter of request is acceptable and consistent with the proposed type of demonstration. During this analysis and review the POI shall ensure the following:

- 1) GACA has approved operator's emergency training program.
- 2) Evacuation procedures in the operator's operations manual (OM), including individual crew member assignments, are realistic, can be practically accomplished, and comply with GACAR §§ 121.761 and 125.341.
- 3) The passenger safety information briefing card is understandable and consistent with the type and model of aircraft to be demonstrated.
- 4) The emergency equipment is acceptable for the type of operation proposed.

**B.** Certain items in the proposal may require on-site evaluations. The POI should determine that the operator has, or is making provisions for participant safety during the demonstration including the use of safety observers, stands, padding, mats, and any other appropriate safety measures. Deficiencies noted during this analysis and review must be resolved with the company's evacuation demonstration coordinator.

**4.26.2.11. THE ABORTED TAKEOFF DEMONSTRATION - PHASE FOUR.** During Phase Four, GACA plans, observes, and evaluates the operator's aborted takeoff emergency evacuation

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demonstration. The planning segment of this phase is particularly important and normally requires thorough coordination and clear instruction and guidance for both GACA and company participants to ensure that the demonstration is conducted and evaluated objectively.

**4.26.2.13. THE ABORTED TAKEOFF DEMONSTRATION - PHASE FIVE.** The operator will be notified immediately of a successful completion of the aborted takeoff emergency evacuation demonstration. The POI will issue operations specification (OpSpec) A3 addressing the maximum passenger seating capacity and the minimum required number of cabin crew members for that aircraft type and model. If the demonstration was unsuccessful, the POI shall brief the operator and notify them in writing of all discrepancies. The operator will then, have an opportunity to re-do the demonstration at a later date.

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## VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION

### CHAPTER 26. EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS FOR PARTS 121 AND 125

#### Section 3. Aborted Takeoff Demonstration Procedures

**4.26.3.1. THE GACA DEMONSTRATION TEAM.** The General Authority of Civil Aviation (GACA) team responsible for evaluating the emergency evacuation demonstration shall be headed by a team leader (TL). When a demonstration is being conducted the GACA Supervisor will normally assign one of the operator's principal inspectors (PIs) to serve as the TL. Assignment of the team leader should be as early as possible in the process (no later than the beginning of Phase Three). The TL is responsible for planning, conducting, and evaluating the emergency evacuation demonstration. He serves as the focal point and central spokesperson for GACA on all matters pertaining to the demonstration. In addition the TL will assign other members of GACA team as needed and ensure these members consist of operations, maintenance and cabin safety expertise.

**4.26.3.3. PREDEMONSTRATION MEETING WITH OPERATOR.** After reviewing and thoroughly evaluating the operator's plan (in Phase Three), the TL should meet with the operator's evacuation demonstration coordinator. During this meeting the TL should accomplish the following:

- Review the operator's plan and ensure that he is thoroughly familiar with the applicable criteria to be used during the demonstration
- Ensure that the operator is aware of its responsibilities regarding participant safety including provisions for safety observers, stands, ramps, padding, and ambulance coordination, as applicable
- Review the method and signals for initiating the demonstration and timing criteria
- In coordination with the operator, determine the signal to be used to terminate the demonstration such as an air horn, or some other clear, distinguishable audible signal. (Experience has demonstrated that a whistle blast may not be adequate.) A suitable device should be agreed upon as early as possible in the planning stage, and tested to assure its adequacy
- Resolve any unanswered questions or issues the operator may have before conducting the

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demonstration

**4.26.3.5. GACA TEAM PLANNING.** The TL must conduct a meeting with GACA team members to assure each team member has a specific assignment during the demonstration. This includes timekeeping, position (inside or outside the airplane), and inspecting the emergency equipment, the airplane, and any applicable documents. The TL should distribute an aircraft diagram to each aviation safety inspector (Inspector) showing their assigned locations for the demonstration. The team must determine which emergency exits shall be opened and which other exits will be blocked.

**4.26.3.7. CREW CRITERIA.** Select “typical” crew members to be used in the demonstration from the list provided by the operator. Normally, typical crew members should not include emergency procedures instructors, supervisors, check pilots, company safety representatives, or others who may have an above average level of experience or exposure to emergency evacuation requirements. The qualifications of the crew members used in the evacuation demonstrations should be consistent with qualifications of line crew members. Normally, crew members used in these demonstrations should have been “line crew members” for the last two years. In addition, whenever possible crew members should not have been used in a demonstration within the last six months. There are smaller airlines where this may not be possible. When this is the case; document and include the former experience in the report regarding the demonstration. When the GACA determines that crew members to be used in the evacuation demonstrations have been allowed to “practice” opening the doors/exits, they should not allow these crew members to be used in the evacuation demonstration, unless the operator’s GACA-approved training program includes this additional training. “Practice” is any training conducted outside of normally scheduled training programs.

**NOTE:** The crew selection criteria used for this demonstration should also be used for ditching demonstrations described in Section 4 of this chapter.

**A.** The operator should present a minimum of two complete crews for the demonstration(s). Two crews are needed in case of a failure using the first crew. The Director, Flight Operations Division should be consulted concerning in the case of two demonstration failures. It is possible that in the case of equipment failures that are not related to operator training or procedures, such as a slide that failed to inflate due to an equipment malfunction. This determination should be coordinated by the POI with the Director, Flight Operations Division to decide if an additional crew is needed or the same crew can be used again.

**B.** It is very important that the “back-up” crew members that may be used if the first

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demonstration fails are not given any information about the first demonstration. Sometimes this is best accomplished by having these crew members isolated in an area which is physically removed from the first evacuation demonstration. However, when these back-up crew members are not held in an area away from the demonstration, they should stay in a group with an Inspector present so the inspector can ensure they are not given any information about the first demonstration.

**C.** When an airline is new, typical line crew members may not be available. When this is the case, the operator must train the first cadre of cabin crew members; it is quite possible that these cabin crew members will also be instructors. Nevertheless, they should not be given instruction or experience that will not be given to cabin crew members who will be expected to serve as cabin crew members on this aircraft on the line. For example, they should not have had “train the trainer” training until after their participation in the evacuation demonstration. Chief cabin crew members or cabin crew member managers who are in charge of the operator’s over all cabin crew member programs should not be used as crew members during evacuation and ditching demonstrations, unless no other cabin crew members have been hired.

**D.** The GACA encourages whenever possible the use of separate crew members for the emergency evacuation demonstration and the ditching demonstration. Some new entrant operators may not be aware of the stress level the crews are facing by participating in these types of demonstrations. Additionally, by providing separate crew members for each demonstration, it provides the GACA with a better assessment of the training program. In the event of a non-cabin crew member demonstration failure (e.g., equipment failure), it is recommended that a new cabin crew member crew be selected from the remaining cabin crew member group.

**E.** The team leader must make certain each team member is aware of the signal to be used to initiate the demonstration and the signal to be used to terminate the demonstration. During the GACA meeting, review regulatory requirements and demonstration criteria to assure common understandings.

### **4.26.3.9. SELECTING EXITS.**

**A.** The TL should evaluate the operator’s procedures when determining the exits to be used and blocked. Fifty percent of the required floor level exits must be opened and the slides or slide/rafts ready for use within 15 seconds. The remaining exits must be blocked. If emergency evacuation procedures dictate that cabin crew members are assigned to open non-floor-level exits as part of

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the cabin crew member duties, these exits must be opened as part of the demonstration within the same 15 seconds. These floor-level exits (doors) and non-floor-level exits (windows or plugs) may be used provided they are designated as exits to be opened by a cabin crew member in the company's evacuation procedures. Ventral (stairs) and tail cone exits should not be used unless they are paired with another exit. If there is any doubt as to which exits are paired, consult the Director, Airworthiness Division. In aircraft having an even number of exits, not more than 50 percent of the total number of exits and slides may be opened and deployed. When an aircraft has an odd number of emergency exits a careful determination should be made before subtracting or adding exits. The exits which are used in the demonstration do not have to be part of an exit pair. TLs in charge of the evacuation demonstration should consult with the Director, Flight Operations Division before making a determination of adding or subtracting an exit.

**B.** Any emergency exit assigned to a cabin crew member as part of their evacuation duties may be selected for use during the evacuation demonstration. For the purpose of this document, a primary exit is one that is assigned to a cabin crew member as the first exit he is assigned to open in the event of an emergency. A secondary exit is the next exit to which a cabin crew member is assigned. For example, the appropriate pages for cabin crew member from the operations manual (OM) stipulates that a cabin crew member sitting next to the floor level exit at L1 would open that exit and then proceed to the floor level exit at R1 and open that exit. When this is the case the primary exit is the L1 door and the secondary exit is the door at R1. If the first exit is blocked then the cabin crew member would proceed to the secondary exit and open it and then inflate the slide or slide/raft. When the cabin crew member opens the first exit, the only actions required at the second floor level exit (secondary exit) are to assess conditions and to redirect passengers away from the unusable exit. Then the cabin crew member should return to the usable exit and command passengers out of the usable exit.

**C.** The team leader must carefully review the operator's emergency evacuation procedures. When deciding which doors or exits are to be opened during a partial demonstration, the GACA must not select a door that is not designated as a primary cabin crew member duty to open, or a secondary door or exit that could not possibly be opened and the slide or slide/raft, if applicable, be ready for use in 15 seconds. For example, if a cabin crew member operated their assigned floor level exit and then proceeded to open an overwing exit that would be considered unrealistic to accomplish operating both types of exits and still meet the 15 second time limit. However, it would be reasonable, at the conclusion of the timed portion of the emergency evacuation demonstration, for a cabin crew member to operate the overwing exit to test the validity of their training as well as the mechanical reliability of the exit. For example, some aircraft are equipped

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with slides that deploy from the overwing exit. This is an opportunity to ensure the exit operates properly and the slide deploys per manufacturer's specifications. If the overwing exit or the slide failed to operate in accordance with manufacturer's specifications, it would not result in a failure of the emergency evacuation demonstration, but rather the failure would need to be addressed with operator personnel and appropriate action taken. Traditionally, one floor level exit from each exit pair was selected to be demonstrated. While this is still an acceptable method, other exit combination possibilities exist and should be considered. For example, if an aircraft is configured with four cabin crew member jump seats adjacent to the four floor level exits, it would be permissible to have one exit pair blocked and the other exit pair be demonstrated. This type of combination would meet the requirement of opening 50 percent of the exits. Past precedence has discouraged one cabin crew member from operating two floor level exits due to the 15 second time constraint; however, this does not exclude or prohibit the team leader from selecting both exits within the pair to be opened and the slides or slide/rafts deployed. The team leader should use good judgment if this option is selected. Careful consideration to the operator's evacuation procedures must be thoroughly evaluated if this option is to be used.

**4.26.3.11. BLOCKING EXITS.** The operator should propose the method for blocking exits. The demonstration team must review the proposal to determine its acceptability. The method that is selected for blocking of exits must require cabin crew members to assess the exit.

A. The following are examples of acceptable methods of blocking exits during an emergency evacuation demonstration:

- 1) To simulate a fire at blocked exits, secure a chemical luminary/cylume stick (glow stick) to the exterior of each exit so that it is visible to a cabin crew member who is assessing the exit. At the initiation signal, designated inspectors will pull lines attached to the glow sticks to remove them from the exits which are to be used and leave the glow sticks on the exits which are not to be used.
- 2) Secure red lights to the exterior of each exit so that when illuminated, they are visible to a cabin crew member who is assessing the exit. At the initiation signal, the lights at exits which are not to be used will be illuminated to simulate fire at blocked exits.
- 3) Secure a visual indicator to the interior side of each exit. Prior to the demonstration, determine what conditions/visual signals the cabin crew members will see during their assessment of the exit that will indicate that the exit is blocked or usable. The method

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selected must ensure that cabin crew members have no indication of which exits will be blocked and which exits will be usable, prior to the initiation signal.

4) Position a flashlight on the exterior of each exit so that when it is illuminated, it is visible to a cabin crew member who is assessing the exit. At the initiation signal, designated Inspectors will illuminate the flashlights to simulate fire at the exits which are not to be used.

**B.** When a method of blocking exits has been determined, the TL must notify the company's project coordinator of GACA concurrence with the method and ensure the company will provide the required maintenance and logistical support to prepare the exit blocking methods.

**C.** The crew members should see the blocking signal on the aircraft in the same ambient conditions that will be present during the demonstration. This could be in addition to a video, a photo, or a demonstration of the signal in a briefing room. It is very important that the cabin crew members have the opportunity to see exactly what they will be seeing on the aircraft during the evacuation demonstration.

### 4.26.3.13. INITIATION SIGNAL.

**A.** Timing of the emergency evacuation demonstration is very important. Fifteen seconds is allowed for the completion of a successful demonstration. Fifty percent of the floor level exits must be opened within 15 seconds and the slide or slide rafts are ready for use. The timing should start at a prearranged signal. The signal should be agreed upon by the GACA and the operator. It is essential that GACA team members be aware of the demonstration initiation signal. The operator should propose a method which provides the same initiation signal for participants inside the airplane and GACA team members outside the airplane. The preferred method is for a company employee to interrupt the airplane's normal source of power by one of the following actions:

- Disconnecting, or turning off an external source of power or a ground power unit
- Disconnecting or turning off the auxiliary power unit
- Power interruption from the cockpit

**B.** This method of initiating the demonstration provides a clear initiation signal in the following

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ways:

- Inside the aircraft, the cabin crew members and GACA team members will observe the normal cabin lighting extinguish followed by the illumination of the emergency lighting system as their signal to commence the evacuation demonstration. It should be noted that these are not simultaneous events and there could be a second or two delays between the cabin lights extinguishing and the illumination of the emergency lighting system. For timing purposes, the demonstration commences when the cabin lights are extinguished.
- Outside the aircraft, GACA observers (stationed at each exit) and the team leader (who serves as the timekeeper) will observe the external lights (for example, taxi lights, anti-collision lights, position lights, and logo lights) extinguish. This is the signal to initiate the timing and other necessary observation actions of the GACA team.
- The timing stops when that exit and slide or slide raft is ready for use
- Timing for slide readiness should be done from outside the aircraft and stops when the slide or slide/raft is ready for use
- Timing for stair readiness should be done from outside the aircraft and should stop when the stairs are fully extended and the bottom is within six inches of the ground
- Timing of exits not equipped with an escape means is often done better from the inside of the airplane. The operator must follow their procedures as provided in the appropriate parts of the OM. The Inspector should insure that the exit is ready for use and then stop the timing.
- The timing stops for evacuation demonstration when the designated exits have been opened and the slides or slide/rafts are ready for use

**C.** When there is no crew member assignment to open an exit, the TL may still require a crew member (either a cabin crew member or a flight deck crew member) to open these exits; however this should not be part of the timed evacuation demonstration. This is one method of determining that the operator's training and procedures are adequate for the airplane and are consistent with the intent of General Authority of Civil Aviation Regulation (GACAR) § 121.213 or 125.189. This requirement could be needed when the aircraft is equipped with stairs, gull wings, overwing exits with slides, tailcones, or when the opening mechanism is new. The

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TL could establish a time limit for opening these “unassigned” exits.

**D.** Ensure the crew members are briefed and aware of the initiation and blocking signals. It is recommended the crew members see and/or hear the initiation signal and the exit blocked signal on the aircraft in the same ambient conditions that will be present during the emergency evacuation demonstration. It is particularly important for the cabin crew members to be familiar with the blocking signals. The blocking signal must be clear, specific, and unambiguous and placed in the same location and position as they will find during the evacuation demonstration. It would be permissible for cabin crew members to assess their exits for familiarity with the blocking signal.

**4.26.3.15. PARTICIPANTS.** Due to the complexity involved in conducting an emergency evacuation demonstration, only those individuals who have a genuine need or concern should be present during the demonstration. Examples of persons who have a genuine need or concern would be representatives from the operator’s training department, aircraft manufacturer, or slide manufacturer. Interested but unessential personnel may present hazards, interfere, or in other ways affect the outcome of the demonstration.

**A.** The operator is responsible for all non-GACA personnel who observe the demonstration. Those not directly involved in the demonstration should be kept at a reasonable distance from the aircraft by some means such as ropes or lines.

**B.** The TL is responsible for GACA personnel who observe the demonstration. GACA observers should be limited to those who are required to evaluate the conduct of the demonstrations or need to be involved for specific reasons such as the following:

- GACA Inspectors whose operators will be acquiring the same or similar type aircraft as the one being demonstrated
- GACA Inspectors completing on-the-job training (OJT) (The GACA is encouraged to communicate its up-coming certification activities to allow other GACA Inspectors to observe the demonstration for completion of OJT.)

**4.26.3.17. PREDEMONSTRATION INSPECTION.** Before the demonstration, the GACA team must inspect the aircraft, emergency and safety equipment. The aircraft must be configured and equipped for takeoff in accordance with the operator’s OM and procedures. The aircraft must be configured in the proposed full passenger seating configuration with all appropriate emergency and safety equipment

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installed. The team must inspect each of the following items to ensure regulatory compliance:

- Hand fire extinguishers for crew, passenger, and cargo compartments
- Protective breathing equipment
- First aid equipment
- Crash ax
- Megaphones
- Interior emergency exit markings
- Flotation devices or life preservers
- Lighting for interior emergency exit markings
- Emergency light operation
- Emergency exit operating handles
- Emergency exit access
- Exterior exit markings
- Exterior emergency lighting and escape route
- Floor level exits
- Additional emergency exits
- Ventral or tail cone exits
- Portable lights
- Seats, safety belts, and shoulder harnesses

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- Emergency equipment required for extended overwater operations
- Public address system
- Passenger information signs/placards
- Airplane fire detection and protection system (operational test)
- Passenger information cards
- Cockpit escape system
- Slides and slide rafts

**4.26.3.19. PREDEMONSTRATION BRIEFINGS.** Before the actual demonstration, three separate briefings should be conducted for the following participants:

- Crew members involved in the demonstration
- The GACA team

**A.** The company's evacuation demonstration coordinator should provide crew members with certain information regarding the demonstration. The coordinator should brief the participants on key objectives and aspects of the exercise including but not limited to a clear understanding of the artificial nature of the exercise. The TL must attend this briefing to resolve any questions to ensure the following information is included:

1) The purpose of the demonstration is to evaluate the following:

- The effectiveness of the company's training program as reflected by the crew members' actions
- The adequacy of the company's emergency procedures
- The effectiveness and reliability of the airplane emergency equipment

2) The initiation signal which begins the demonstration must be clearly specified. Ensure the crew members are briefed and aware of the initiation and blocking signals. It is

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recommended the crew members see and/or hear the initiation signal and the exit blocked signal on the aircraft in the same ambient conditions that will be present during the emergency evacuation demonstration. It is particularly important for the cabin crew members to be familiar with the blocking signals. The blocking signal must be clear, specific, and unambiguous; and placed in the same location and position as they will find during the evacuation demonstration. It would be permissible for cabin crew members to assess their exits for familiarity with the blocking signal.

- 3) The significance of the 15-second time limit should be discussed.
- 4) The signal to be used by the TL for terminating (stopping) the demonstration such as an air horn, or some other clear audible means should be described. Any evacuation activity in progress must immediately cease with a “stop” signal.
- 5) The importance of safety during the demonstration including crew member responsibilities, safety observer duties, and limitations should be emphasized.

**B.** The TL shall brief the GACA team as follows:

- State the objectives of the demonstration
- Review the initiation signal
- Review observer assignments with regard to exits to be used or blocked
- Review the signal which stops the demonstration
- Remind the team members not to discuss the results of their observations with persons other than the team leader

### **4.26.3.21. CONDUCTING THE DEMONSTRATION.**

**A.** The team leader shall ensure all pre-demonstration briefings and inspections are conducted before the actual demonstration. The following sequence of events represents an acceptable means, derived from past experience, for conducting the demonstration.

**B.** Cabin crew members will accomplish the following:

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- 1) Prepare for a normal departure in accordance with the operator's procedures, including closing and securing all exits, galleys, and arming the emergency evacuation system for takeoff.
- 2) Conduct a passenger briefing in accordance with GACAR § 121.1249 or § 125.461 and the company's procedures.
- 3) Be seated at their assigned positions with their restraint systems fastened.
- 4) The GACA team then ensures that each external door and exit, and each internal door or curtain is in position for a normal takeoff.

**C.** Before the initiation signal, the flight crew member shall accomplish all tasks on appropriate checklists and configure the aircraft for a normal takeoff. The flight crew member must be seated in their normal positions with their restraint systems fastened.

**D.** After completing all required pre-takeoff actions, the captain shall inform the TL (who is positioned forward of the nose of the aircraft), by ground interphone, that the aircraft is ready for takeoff.

**E.** Once the TL has been told that the crew is ready, he must make certain all GACA team members and company safety observers (if used) are ready and in position. The TL will then issue a warning signal (air horn or whistle blast) which should precede the initiation signal by approximately 30 seconds. Depending upon the method approved by the GACA (as in the operator's plan) the TL shall inform the company evacuation demonstration coordinator to initiate the demonstration.

**F.** The TL will coordinate the timekeeping with two stopwatches (a primary and a back-up). The timing will begin when the external airplane lights extinguish. The timing will end when all selected exits/slides or slide/rafts are ready for use. At the end of the 15 seconds the TL shall issue a clear, audible signal terminating the demonstration.

**G.** Each GACA observer assigned to exits which are to be used is responsible for determining that his assigned exit was opened and each slide or slide raft (as applicable) was ready for use before the TL's termination signal. Any exit, slide, or slide raft that was not ready for use before the termination signal constitutes an unsatisfactory demonstration.

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**H.** The GACA team members assigned to the cabin shall ensure that all required equipment worked properly (for example, floor proximity lighting, emergency exit lights).

**I.** It is important that team members do not discuss the results of their observations with company personnel or passenger participants. After the demonstration has been terminated, the GACA team shall confer immediately on the observation of each team member and the overall conduct of the demonstration before advising the operator of the demonstration results.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 26. EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS FOR PARTS 121 AND 125**

##### **Section 4. Ditching Demonstration**

###### **4.26.4.1. GENERAL.**

A. An applicant or operator who proposes to operate a aircraft in extended over-water operation must conduct a ditching demonstration. The ditching demonstration is conducted in accordance with the requirements specified in General Authority of Civil Aviation Regulation (GACAR) §§ 121.217 or 125.190, and the direction and guidance provided in this section. The purpose of the demonstration is to evaluate the operator's ability to safely prepare the passengers, aircraft, and ditching equipment for a planned water landing. During the demonstration the following four areas are evaluated:

- Emergency training program
- Ditching procedures
- Crew member competency
- Equipment reliability

B. Ditching and water landing are defined differently. Ditching as commonly used in aviation is a planned event. When the aircraft lands in the water without warning, this is an unplanned water landing. A ditching demonstration will simulate a planned water landing. The preparation for ditching is similar in nature to the preparation for a planned evacuation.

**4.26.4.3. CREW MEMBER CRITERIA.** The selection and number of crew members to be used in the ditching demonstration is very important. The Crew Selection Criteria found in Section 3, Aborted Takeoff Demonstration Procedure, paragraph 4.26.3.7 should be used as the selection criteria for this demonstration.

**4.26.4.5. REGULATORY REQUIREMENTS.** GACAR §§ 121.217 or § 125.190 requires an operator to conduct a ditching demonstration for each type and model of aircraft used in extended

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overwater operations. This demonstration must be conducted in accordance with each of the conditions stipulated in GACAR § 121.217(b) or § 125.190(b), as appropriate. The ditching demonstration is conducted as follows:

- A.** The demonstration must be conducted during daylight hours or in a lighted hangar if conducted at night.
- B.** The General Authority of Civil Aviation (GACA) minimum required crew complement (both flight crew and cabin crew members) must be available and used during the ditching demonstration.
- C.** When an operator's procedures use able-bodied persons (ABPs) to remove or launch life rafts, then the same number of persons who will act as ABP(s) must be used in the demonstration. The ABP(s) should be provided by the operator and should have experiences similar to average passengers. Crew members, mechanics, and other operator personnel who would have knowledge regarding the use of emergency equipment should not be used. The GACA should insure that able bodied persons are not given additional training. The ABP(s) should be briefed and perform the duties as stipulated in the appropriate crew member operations manual (OM). The operator should supply enough ABP(s) to ensure coverage if the first demonstration fails.
- D.** Stands must be placed at each emergency exit and wing. The life rafts or slide rafts should be inflated onto the stands and then lowered to the hangar floor. This will prevent injury to participants, as well as damage to the life rafts or slide rafts.

**NOTE:** GACAR §§ 25.807(d) and 29.807(d) requires that, during type certification, ditching emergency exits must be above the calculated waterline which will exist when the aircraft is at rest in the water. This "waterline" and the designated ditching emergency exits are defined in the "manufacturer's ditching document" which is part of the final type certification report. The operator should obtain waterline and ditching exit information from the manufacturer. This waterline is where the tops of the stands should be positioned.

- E.** Each evacuee (crew members and passenger participants (ABPs), if applicable) must don and inflate a life preserver according to the operator's procedures and the cabin crew member's briefing.
- F.** Each life raft or slide raft must be launched and inflated according to the operator's procedures. When operator procedures require a survival kit to be attached to a door mounted slide/raft, the

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survival kit must be attached prior to inflation. All required emergency equipment must be placed in the rafts. Each evacuee must enter a life raft or slide raft. The crew members assigned to the raft shall locate and describe the use of each piece of emergency equipment.

**G.** Each life raft must be removed from stowage for inspection. One life raft or slide raft (selected by the S&ER) shall be inflated and launched and the evacuees assigned to that raft shall get in it. The rafts and/or slide rafts must be the same as those used on the aircraft.

**NOTE:** In addition, they must be equipped as they would be on the aircraft in regular operations. The crew members assigned to the raft shall locate and describe the use of each item of emergency equipment.

**4.26.4.7. THE DITCHING DEMONSTRATION PLAN.** The ditching demonstration is normally conducted after the satisfactory completion of the aborted takeoff emergency evacuation demonstrations. In these situations, the same GACA team leader (TL) and GACA team members should conduct and observe the ditching demonstration. If an operator plans to initiate flights into extended-overwater areas for the first time, with an airplane that they previously operated over land areas, they must conduct a ditching demonstration (see paragraph 4.26.4.5, in this section).

**A.** If the operator plans to conduct the ditching demonstration in conjunction with the emergency evacuation aborted takeoff demonstration, the operator's aborted takeoff demonstration plan must include information applicable to the ditching demonstration such as the following:

- 1) Copies of the operator's OM relating to crew member's ditching duties and responsibilities
- 2) A description of applicable emergency equipment used for ditching (such as life rafts, survival gear) including the type and model of the emergency equipment.

**B.** If the operator must conduct a ditching demonstration that is not in conjunction with an emergency evacuation aborted takeoff demonstration, the operator's demonstration plan must be submitted at least 15 working days before the date of the actual demonstration. This plan must include the information in subparagraph A above and the following additional information:

- 1) The aircraft type and model which will be used.

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- 2) The proposed date, time, and location of the ditching demonstration.
- 3) The name and telephone number of the company's ditching demonstration coordinator.
- 4) A representative diagram of the aircraft which includes the following:
  - a) Location and designation of each exit.
  - b) Location of each item of emergency ditching equipment including:
    - Life rafts/slide rafts
    - Survival radios
    - Pyrotechnic signaling devices
    - Passenger/crew member life preservers or individual floatation devices
- 5) A list of all crew members (both flight crew and cabin crew members) that are qualified to participate in the demonstration must be in the operator's plan. The crew members must be qualified in the aircraft to be used; however, the initial operating experience requirement need not be completed. Cabin crew member personnel must have completed an approved training program for the type and model of airplane being demonstrated. For Part 125 the training required by that part must be completed. Cabin crew members designated by the GACA to participate in the demonstration shall not be provided emergency training or aircraft emergency equipment familiarization more than specified in the operator's approved training program before the demonstration.
- 6) Copies of the appropriate crew member OM pages describing ditching duties and responsibilities, including cabin preparation time parameters for both planned and unplanned ditching.

### **4.26.4.9. REVIEW OF THE DITCHING DEMONSTRATION PLAN.**

- A. When the ditching demonstration plan has been submitted, the Principal Operations Inspector (POI) must review the proposal to ensure the following:

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- 1) The proposed demonstration will meet the criteria in GACAR §§ 121.217 or 125.190, as applicable.
- 2) The emergency training program and ditching procedures in the operator's OM must have been approved and accepted and provide for safe operating practices.
- 3) The ditching duties and responsibilities, including cabin preparation time parameters for both planned and unplanned ditching is realistic and is understood by all.

**B.** The GACA team must plan for the observation and evaluation of the ditching demonstration. Normally, the demonstration is conducted after the completion of a successful aborted takeoff emergency evacuation demonstration.

**4.26.4.11. CONDUCT OF THE DITCHING DEMONSTRATION.** The ditching demonstration shall be conducted in the following manner:

- A. Before the ditching demonstration the team shall inspect each item of emergency ditching equipment for compliance with appropriate airworthiness and other relevant directives.
- B. The TL ensures aviation safety inspectors (Inspectors) and crew members are at their assigned positions and then advise the captain to commence the demonstration.
- C. The amount of time a crew is given to prepare the cabin for a ditching demonstration should be reasonable. The OM should stipulate crew member notification, including time parameters for both planned and unplanned ditching, before touchdown, etc., in their crew member OM. The cabin crew members should be performing duties associated with normal flight such as serving meals with the cart in the aisle when the signal to ditch is given. The timing should start when the pilot notifies the cabin crew members of the impending ditch. The crew members must use the operator's procedures as outlined in the appropriate OM. The timing stops when cabin crew members have completed preparations and notify the captain that the cabin is prepared. It is important that Inspectors evaluating ditching procedures ensure that both timing and preparations follow those stipulated in the operator's OM.
- D. The TL begins timing when the captain issues the prepare-for-ditching order. At the end of the fifteen minutes, or other agreed upon time for the planned ditching demonstration, the crew must be prepared for a simulated water landing. After the simulated aircraft landing and stopping, each crew member must follow the operator's procedures as contained in the appropriate OM

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regarding the launching and boarding of life rafts and/or slide rafts. If the aircraft has more than one type of raft, then each type should be launched, but only one type needs to be boarded. After the timing has stopped each crew member must board the raft and must be able to answer questions regarding the location and function of various pieces of equipment on the raft, describe the use of each item in the survival kit, and erect the canopy as a group. The current regulations require that training programs ensure that each crew member remains adequately trained and currently proficient with respect to each airplane, crew member position, and type of operation in which he or she serves. If a crew member fails to answer the appropriate questions then the TL should carefully evaluate the question and failure to answer so that appropriate changes to the operator's training program can be made, if needed. However, the failure of one crew member to answer a question may not constitute failure of the demonstration.

**E.** GACAR §§ 121.217(b)(3) and 125.190(b)(3) require that one life raft (or slide raft), designated by the TL, to be launched and inflated. However, if a slide raft is the primary means of flotation, then this should be the selected raft. For the purpose of this demonstration “launching” a life raft means to remove it from stowage, manipulate it out of the airplane (via stands or ramps), and position it on the ground before inflation. “Launching” a slide raft means to inflate it in a normal manner and then lower it to the ground.

**NOTE:** GACAR §§ 121.217(b)(3) and 125.190(b)(3) do not require detachment of each slide raft from its respective door mounting. However, each slide raft must be inspected for its airworthiness. Any life rafts stowed inside the aircraft must be removed from stowage and placed on the cabin floor for inspection.

**F.** When an operator's procedures use able bodied persons (ABPs) to remove or launch life rafts, then the same number of ABPs should be used in the demonstration. The ABPs should be provided by the operator and should have experiences similar to average passengers. Crew members, mechanics, and other operator personnel who would have knowledge regarding the use of emergency equipment should not be used. The GACA should insure that able-bodied persons are not given additional training. The ABPs should be briefed and perform the duties as stipulated in the appropriate crew member OM. The operator should supply enough ABPs to ensure coverage if the first demonstration fails.

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**CHAPTER 26. EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS  
FOR PARTS 121 AND 125**

**Section 5. Evaluate Emergency Evacuation and Ditching Demonstration Procedures for Parts 121 and 125**

**4.26.5.1. EVALUATE OPERATOR'S PRE-DEMONSTRATION CREW MEMBER BRIEFING .**

A. Ensure that the operator's demonstration project coordinator includes the following items in the crew member briefing:

- The purpose of the demonstration
- The initiation signal
- The significance of the time limits for partial evacuation, or ditching, as applicable
- The signal to be used by the General Authority of Civil Aviation (GACA) team leader (TL) for stopping the demonstration. Any evacuation or ditching activity in progress must cease immediately with a stop signal
- The importance of safety during the demonstration, including crew member responsibilities and safety observer duties and limitations

1) If the briefing was satisfactory, proceed with the emergency evacuation demonstration or ditching demonstration, as applicable.

2) If the briefing was not satisfactory, inform the demonstration project coordinator of the deficiencies. Have the crew members briefed again. When the briefing is satisfactory, proceed with the emergency evacuation demonstration or ditching demonstration, as applicable.

**4.26.5.3. EVALUATING EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS.**

**A. Evaluation Requirements.** During the observance of the aborted takeoff demonstration or the

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ditching demonstration, the GACA team evaluates the following:

- Crew member compliance and effectiveness in performing assigned duties and responsibilities
- The flight crew's effectiveness in exercising command responsibilities and the coordination and communication between the flight crew and cabin crew members
- Any shortcomings, deficiencies, or delays caused by the emergency equipment
- Adherence to applicable time limits
- Proper opening of all designated exits and slides. Designated exits and slides must be ready for use. If applicable, all passengers and crew members must properly evacuate within the appropriate time limit.
- Efficient removal of life rafts from storage
- Proper inflation of the designated life raft or slide raft
- The capability of each item of emergency equipment to perform its intended function

### 4.26.5.5. DETERMINING RESULTS OF DEMONSTRATIONS.

**A. Unsatisfactory Demonstration.** Failing to meet a specified time limit is automatic grounds for an unsatisfactory demonstration. Deficiencies in other areas such as crew member effectiveness or equipment malfunctions which occur even when timing criteria is met may be grounds for determining the demonstration unsatisfactory. The severity of the deficiency and the basic cause must be carefully considered. If the cause of a relatively severe deficiency was due to improper company training, procedures, or maintenance, the demonstration should be judged as unsatisfactory. For example, if all emergency lighting failed to illuminate due to a maintenance problem, there is sufficient grounds for determining the demonstration unsatisfactory. Minor deficiencies can usually be resolved with responsible company personnel without having to declare the demonstration unsatisfactory.

**B. Satisfactory Demonstrations.** When the operator meets the specified time limits and any minor discrepancies are resolved, the demonstration is considered satisfactory.

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**C. Reporting Requirements.** The TL is responsible for the preparation and distribution of the emergency evacuation or ditching demonstration report. The report shall include at least the following:

- Emergency Evacuation Demonstration Report. A form is required for each demonstration attempt. For example, if two demonstrations are unsuccessful and a third is satisfactory, three forms shall be completed and submitted as part of the demonstration report package.
- The passenger information briefing card required by GACAR Part 121 and 125
- A diagram of the aircraft, including emergency equipment, exits, exits used, the number of approved passenger seats, and the location of seats used by cabin crew members
- The name and specialty of each member of the General Authority of Civil Aviation (GACA) team

### **4.26.5.7. TASK OUTCOMES.**

**A. GAR.** Complete and file the GAR.

**B. Task Completion.** Completion of this task will result in one of the following:

- 1) Completion of the Emergency Evacuation Demonstration Report, indicating the emergency evacuation or ditching demonstration was satisfactory.
- 2) Completion of the Emergency Evacuation Demonstration Report, indicating the emergency evacuation or ditching demonstration was unsatisfactory.

**C. Task Documentation.** File all supporting paperwork in the operator's office file.

### **4.26.5.9. FUTURE ACTIVITIES.** The record of any emergency evacuation or ditching demonstration will be reviewed in future surveillance.

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#### **CHAPTER 26. EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS FOR PARTS 121 AND 125**

##### **Section 6. Evaluate Issues for Emergency Evacuation/Ditching Procedures/Demonstrations**

###### **4.26.6.1. BACKGROUND.**

A. The preceding sections in this chapter provide procedures and policy direction to use when planning and conducting emergency evacuation and ditching demonstrations. These demonstrations are observed by General Authority of Civil Aviation (GACA), aviation safety inspectors (Inspectors) that have operations and airworthiness backgrounds. It is recommended that the team also include Inspectors with cabin safety expertise, if available.

B. This section provides guidance and procedures for Inspectors on the team and the team leader (TL) to use in order to review the demonstrations that are reported as unsatisfactory. It also provides guidance and procedures that the team may use to evaluate the required demonstrations.

###### **4.26.6.3. UNSATISFACTORY DEMONSTRATIONS.** The severity and basic cause of the deficiency must be considered. Minor deficiencies usually can be resolved by responsible company personnel without having to declare the demonstration unsatisfactory.

A. A demonstration is unsatisfactory if the operator fails to meet the specified time limit.

B. Crew member ineffectiveness or equipment malfunctions may be grounds for declaring a demonstration to be unsatisfactory.

C. If a relatively severe deficiency occurs due to improper company training, procedures, or maintenance, the demonstration should be declared unsatisfactory.

###### **4.26.6.5. COORDINATION REQUIREMENTS.** This task may require coordination with the Director, Flight Operations Division and other GACA senior management.

###### **4.26.6.7. EVALUATING EMERGENCY EVACUATIONS AND DITCHING DEMONSTRATIONS.**

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**A. Evaluate the Demonstration.** After the demonstration, confer with GACA team members. Reach agreement on the results before discussing the demonstration with the operator.

1) Evaluate the following areas of the demonstration:

- Crew member compliance and effectiveness in performing assigned duties and responsibilities
- Flight crew effectiveness in exercising command responsibilities
- The coordination and communication between the flight crew and cabin crew members
- The operation and airworthiness of emergency equipment. Note any deficiencies or delays caused by the emergency equipment.

2) Ensure that each designated exit and slide was opened, deployed, and ready for use within appropriate time criteria.

3) Ensure that the following occurred:

- a) For a partial emergency evacuation demonstration, designated exits were opened and slides ready for use within 15 seconds.
- b) For ditching demonstrations, the life rafts were efficiently removed from stowage. Each designated life vest, life raft, and slide raft was properly inflated.

**B. Determine if Demonstration Was Unsatisfactory.**

1) A demonstration must be declared unsatisfactory if the operator fails to meet the time limit.

2) In addition, a demonstration may be declared unsatisfactory for the following reasons:

- Crew member ineffectiveness or equipment malfunctions
- The occurrence of a relatively severe deficiency due to improper company training, procedures, or maintenance

3) If the inspection is unsatisfactory, determine if the problem can be corrected immediately.

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- a) If the problem cannot be corrected immediately, reschedule the demonstration.
- b) If the problem can be corrected immediately, ensure that corrective action is taken.

**C. Advise the Operator of the Results of the Demonstration.** Once an agreement on the demonstration results has been reached, advise the applicant or operator of the results.

- 1) If the results are unsatisfactory, issue a letter of disapproval to the operator or applicant.
- 2) If the results are satisfactory, issue a letter of approval to the operator or applicant.

### **4.26.6.9. TASK OUTCOMES.**

**A. GAR.** Complete and file the GAR.

**B. Task Completion.** Completion of this task will result in one of the following:

- A letter of demonstration approval
- A letter of demonstration disapproval

**C. Task Documentation.** File all supporting paperwork in the operator's office file.

### **4.26.6.11. FUTURE ACTIVITIES.** Normal surveillance.

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#### **CHAPTER 26. EMERGENCY EVACUATION AND DITCHING DEMONSTRATIONS FOR PARTS 121 AND 125**

##### **Section 7. Reporting Evacuation Demonstrations**

**4.26.7.1. GENERAL.** The General Authority of Civil Aviation (GACA) team leader (TL) is responsible for preparing and distributing the emergency evacuation or ditching demonstration report. The report must include at least the following:

- A.** An Emergency Evacuation Demonstration Report is required for each demonstration attempt. For example, if two demonstrations are unsuccessful and a third is satisfactory, three forms must be completed and submitted as part of the demonstration report package.
- B.** The passenger information briefing card.
- C.** A diagram of the aircraft is required, including emergency equipment, exits, exits used, the number of approved passenger seats, and the location of seats which were used by cabin crew members.
- D.** A list of names and specialty of each member of the GACA team is required.

**4.26.7.3.** The Emergency Evacuation Demonstration Report (Figure 4.26.7.2) must be completed in accordance with the instructions in Figure 4.26.7.1.

##### **4.26.7.5. DISTRIBUTION.**

- A.** After the supervisor reviews and initials the report, a copy must be forwarded to the Director, Flight Operations Division. The original package will be retained in the office file.

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**Table 4.26.7.1. Instructions for Emergency Evacuation Demonstration Report**

BLOCK NUMBER	DEMONSTRATION
1	Fill in date and time of the demonstration (use 24-hour time).
2	Check results of the demonstration (Sat or Unsat)
3	Fill in full and proper name of the airline and its four-letter designator.
4	Complete aircraft make, model, series, and number.
5	Fill in names and titles of GACA team members.
6	Check the appropriate block for the type of demonstration. Both an aborted takeoff and ditching demonstration block may be checked, if applicable.
7	Check the reasons for conducting the demonstration.
8	Enter the total number of flight crew members, cabin crew members, and passengers aboard the airplane.
9	Check the applicable GACARs.
10	List each exit used and note whether the exit operated properly.
11	Check the appropriate block for the type of slide used.
12	Enter the total elapsed time in the appropriate block.
13	Check the appropriate box which describes the airplane location.
14–20	Check the appropriate box (Sat or Unsat).
21	Briefly describe how non-designated exits were blocked (for example, exits were blocked with red lights).
22	Briefly describe how the demonstration was initiated (for example, deactivated the normal source of power).
23	Remarks must reference the appropriate block number. More than one line may be used for one item. Comments must be listed for each unsatisfactory item.
24	The team leader signs this report and the supervisor initials it.

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**Figure 4.26.7.2. Emergency Evacuation Demonstration Report**

EMERGENCY EVACUATION DEMONSTRATION REPORT											
<i>Instructions:</i> Attach briefing card and diagram of aircraft showing location of cabin crew member seats, emergency equipment, and exits used for the demonstration.											
1. Date and Time of Demonstration:						2. Results: A. <input type="checkbox"/> Satisfactory B. <input type="checkbox"/> Unsatisfactory					
3. Name of Operator and Designator:											
4. Make, Model, Series, and Registration Mark:											
5. Name and Title of GACA team members:											
6. Type of Demonstration A. <input type="checkbox"/> Aborted Takeoff Partial B. <input type="checkbox"/> Ditching Partial			7. Reason for Demonstration A. <input type="checkbox"/> Initial Introduction Into Service (this operator) B. <input type="checkbox"/> Increased Seating Capacity C. <input type="checkbox"/> Change in Cabin Configuration D. <input type="checkbox"/> Change in Cabin Crew Member Number, Duties, Location, or Procedures			E. <input type="checkbox"/> Change in Exit Number Location, or Opening Mechanism F. <input type="checkbox"/> Other (Specify)					
8. Number of Persons on Board A. Flight Crew _____ B. Cabin Crew members _____ C. Total _____			9. Applicable Regulations A. <input type="checkbox"/> GACAR § 121.213 B. <input type="checkbox"/> GACAR § 121.217 C. <input type="checkbox"/> GACAR §125.189 D. <input type="checkbox"/> GACAR §125.190								
10. Exits Used*  A      B      C D      E      F			11. Type Slides Used A. <input type="checkbox"/> Inflatable B. <input type="checkbox"/> Non-inflatable C. <input type="checkbox"/> Slide Raft			12. Time Record A. <input type="checkbox"/> Aborted Takeoff Partial _____ Sec. B. <input type="checkbox"/> Ditching Partial _____ Min.					
Comment Record											
13. Aircraft Location A. <input type="checkbox"/> Hangar      B. <input type="checkbox"/> Ramp				17. Crew Knowledge A. <input type="checkbox"/> Satisfactory      B. <input type="checkbox"/> Unsatisfactory							
14. Company Safety Precautions A. <input type="checkbox"/> Satisfactory      B. <input type="checkbox"/> Unsatisfactory				18. Equipment Reliability A. <input type="checkbox"/> Satisfactory      B. <input type="checkbox"/> Unsatisfactory							

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 27. CABIN SAFETY AND CABIN CREW MEMBER SPECIAL EMPHASIS ITEMS FOR PART 121 AND 125**

##### **Section 1. General Information**

**4.27.1.1. PURPOSE.** This chapter contains policy, procedures and guidance regarding cabin safety information and Cabin Crew Member (CCM) duties and responsibilities.

**4.27.1.3. BACKGROUND.** The information contained in this chapter has been compiled from policy documents issued by various aviation regulatory organizations. These documents address conditions or problems applicable to operator safety with regard to the duties and responsibilities of CCMs. As such, they provide guidance regarding changes or advances in operator procedures and practices involving aircraft or equipment, operations and communications.

**4.27.1.5. ORGANIZATION OF CHAPTER.** The contents of each section is described below:

- A. Section 1.** Contains information regarding the introduction and general information about the sections in the chapter.
- B. Section 2.** Contains information regarding special airworthiness requirements related to cabin safety.
- C. Section 3.** Contains information regarding instrument and equipment requirements.
- D. Section 4.** Contains information regarding CCM requirements.
- E. Section 5.** Contains information regarding CCM qualifications.
- F. Section 6.** Contains information regarding flight operations—cabin safety.

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#### **CHAPTER 27. CABIN SAFETY AND CABIN CREW MEMBER SPECIAL EMPHASIS ITEMS FOR PART 121 AND 125**

##### **Section 2. Special Airworthiness Requirements**

###### **4.27.2.1. MANUAL INSTRUCTIONS CONCERNING MINIMUM EQUIPMENT LIST**

**CONDITIONS AND LIMITATIONS.** The purpose of this section is to provide guidance to aviation safety inspectors (Inspectors) regarding the requirement for operators to include instructions, concerning the Minimum Equipment List (MEL) conditions and limitations, in documents such as the Operations Manual (OM) and the Maintenance Manual (MM).

- A.** A sampling of operator's manuals revealed that there is a need to include additional instructions, necessary to clarify the actions to be taken under certain conditions and/or situations regarding the MEL.
- B.** Some items/systems listed in the MMEL/MEL contain standard phrases such as "provided alternate, normal and emergency procedures, and/or operating restrictions are established and used." The intent of such language is to prompt each operator to develop the necessary instructions in the manual or its personnel so that appropriate action will be taken, resulting in an acceptable level of safety.
- C.** In accordance with the MEL, the communications equipment used between the flight deck and the CCMs (whether inoperative or functional), requires that specific instructions be included in the applicable operator's OM. In some cases it may be appropriate to include such instructions in the operator's MEL (O) procedure. Instructions in these manuals concerning specific inoperative equipment situations must be consistent with instructions in all other applicable manuals.
- D.** To ensure a clear understanding of the action to be taken in emergency or abnormal situations, the pilot-in-command (PIC) should brief the flight crew, and at least the lead cabin crew member on the procedures to be followed. Examples of methods of flight deck notification to cabin include various combinations such as cabin chimes to indicate various events, use of a separate evacuation signaling system, public address (PA) announcements, or others. The briefing is to ensure that when cabin/flight deck communication equipment becomes inoperative, procedures

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to be followed for each event listed can be carried out:

- Fire and/or smoke in the flight deck or passenger cabin
- Hijacking
- Ditching
- Emergency landing
- Evacuation of the passenger cabin/Rejected Takeoff evacuation
- Passenger medical problem

**NOTE:** It is *not* the General Authority of Civil Aviation's (GACAs) intention to impose a requirement to preclude a CCM from opening the flight deck door to report an emergency situation.

**E.** Inspectors should strongly encourage each of their operators to include adequate instructions, to specify actions to be taken in the case of emergency or abnormal situations, when MEL items are involved. Inspectors should also inform their operators of the need for the Pilot-In-Commands (PICs) to brief the flight crew and the lead CCM and/or concerned CCMs of the actions to be taken in emergency or abnormal situations, in preparations of the possible break down of cabin/flight deck communication equipment.

### **4.27.2.3. OVERPRESSURIZED AIRPLANES.**

#### **A. Accidents Related to Over-Pressurized Airplanes.**

1) On November 20, 2000, a CCM was killed during an emergency evacuation of an Airbus Industrie A300B4-605R (A300). The airplane was pressurized until the CCM opened the left front (1L) emergency exit door. He was then forcibly ejected from the airplane. There were 133 people on board. During the emergency evacuation:

- The CCM who opened the emergency exit was killed
- Three passengers sustained serious injuries

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- Eighteen passengers and one flight service director sustained minor injuries

**NOTE:** The airplane sustained minor damage.

2) The accident investigation conducted by the United States (US) National Transportation Safety Board (NTSB) resulted in recommendations that included the following: Review all operators' flight and CCM training manuals and programs and require revisions, if necessary, to ensure that they contain information about the signs of an over-pressurized airplane on the ground and the dangers of opening emergency exit doors while the airplane is over-pressurized. They also included a recommendation that CCM training manuals and programs contain procedures to follow during an emergency evacuation when the airplane is over pressurized.

3) A similar accident occurred on October 20, 2001. In that accident, one CCM was killed and another CCM was seriously injured during the deplaning of an Airbus A300-605R. There were 2 flight crew members, 10 cabin crew members, and 134 passengers on board.

### **B. Accident Review.**

1) Inspectors must ensure that operators include information about the signs of an over-pressurized airplane on the ground and the dangers of opening emergency exit doors while the airplane is over-pressurized into their flight crew and CCM training manuals.

#### **4.27.2.5. UPRIGHT POSITION OF SEAT BACKS FOR TAKEOFF AND LANDING.**

**A. Requirements.** Per General Authority of Civil Aviation Regulation (GACAR) § 121.1241 no operator may take off or land an aircraft unless each passenger seat back is in the upright position. Each passenger *must* comply with instructions given by the cabin crew member.

**B. Seat Position.** Transport category airplanes are customarily provided with seats that are part of an approved interior of the particular type design and comply with GACAR Part 25. This includes many emergency evacuation considerations, such as the seat designs, their pitch, and location. When reclined to any degree, the seats are not in the upright position for emergency evacuation, which must be demonstrated during aircraft certification. Part 121 requires that the seat back must be in this fully upright position, not in any other position, for takeoff and landing, to assure the degree of safety intended for emergency evacuation.

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**NOTE: GACAR § 121.1241:**

- Does not apply to seat backs placed in other than the upright position in compliance with the emergency exit access requirements under GACAR § 121.445(c).
- Does not apply to a seat on which cargo or a person unable to sit upright for a medical reason is carried according to procedures in the operator's manual if the seat back does not obstruct any passenger's access to the aisle or to any emergency exit.

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### CHAPTER 27. CABIN SAFETY AND CABIN CREW MEMBER SPECIAL EMPHASIS ITEMS FOR PART 121 AND 125

#### Section 3. Instrument and Emergency Equipment Requirements

##### 4.27.3.1. EMERGENCY MEDICAL KITS (EMK).

**A. Required Contents.** General Authority of Civil Aviation Regulation (GACAR) Part 91, Appendix B, provides a list of the required contents of medical kits. Each operator is responsible for assuring that the medical kits meet the required specifications.

**B. Storage of Emergency Medical Kits (EMKs).** Operators should be aware of the temperature range which may be established for some drugs contained in the medical kits. “Damaging temperatures” means temperature extremes which cause the EMK medications to lose their effectiveness. At the present time, the aircraft cabin environment does not appear to affect required medications negatively as long as they are replaced before their expiration date.

1) If an aircraft has been exposed to extreme hot or cold temperatures, medications in a liquid form (injectable) should be inspected before use. If they are yellow or cloudy, then they may have lost their effectiveness and should not be used. If an aircraft is parked or taken out of service for an extended period of time in a location where it may be exposed to temperature extremes, then the EMK should be taken off the aircraft and protected.

##### 4.27.3.3. DIFFERENCES IN AIRCRAFT CABIN EMERGENCY EQUIPMENT.

Wherever possible, operators should standardize the type and location of aircraft emergency equipment. For example, an airline with B-737s and A-320s could equip each aircraft with the same type of halon fire extinguishers and locate them next to the forward and aft Cabin Crew Member (CCM) seats which are occupied by CCMs during takeoff and landing.

**A. Differences in Location and Operation of Emergency Equipment.** When there are differences in the location or operation of emergency equipment, operators must ensure that CCMs are familiar with these differences. Operators must familiarize CCMs on differences by revising appropriate manuals. Operators issue these manuals to CCMs before they are assigned duties on board any of the affected aircraft.

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**B. Difference Training and Competency Checks.** During the required emergency training, operators should give CCMs training and competency checks regarding the equipment differences. Operators should develop a procedure so that items of emergency equipment are checked, by a CCMs designated in the appropriate operations manual (OM), to ensure that each item is properly stowed and serviceable. This procedure will increase CCM familiarity with the location and operation of emergency equipment, and it is especially needed when there are differences in the location and operation of emergency equipment.

**NOTE:** Part 125 does not contain a requirement for Differences training.

### 4.27.3.5. CABIN CREW MEMBER PROTECTION FROM BLOODBORNE PATHOGENS.

**A. Overview.** This paragraph contains information and guidance for aviation safety inspectors (Inspectors) and operators concerning CCM protection from INCIDENTAL EXPOSURE to blood borne pathogens. Although unlikely, it is possible that CCMs could come in contact with body fluids contaminated with blood borne pathogens. Therefore, operators should supply readily accessible protective non permeable gloves and have in place an infection control program consistent with International Standards. Infection control programs for workers who could be exposed to blood borne pathogens include exposure determination criteria, infection control plans, methods of compliance, and work place controls. Reference to Federal Aviation Administration (FAA) Advisory Circular (AC) 120-44, (as amended), Air Carrier First Aid Programs can be reviewed by Inspectors to obtain some useful information regarding this issue.

**B. Infection Awareness Programs.** Inspectors shall advise their assigned operators to have an infection awareness program consistent with recognized International Standards which provides information about the prevention of infectious diseases, especially those caused by blood borne pathogens; ask their operators to provide protective non permeable gloves on the aircraft in sufficient quantities to equal the number of medical and first aid kits.

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#### **CHAPTER 27. CABIN SAFETY AND CABIN CREW MEMBER SPECIAL EMPHASIS ITEMS FOR PART 121 AND 125**

##### **Section 4. Cabin Crew Member Requirements**

###### **4.27.4.1. NUMBER OF CABIN CREW MEMBERS REQUIRED DURING BOARDING, DEPLANING AND AT STOPS WHERE PASSENGERS REMAIN ON BOARD.** General

Authority of Civil Aviation Regulation (GACAR) § 121.757 provides specific relief during the passenger boarding, deplaning at stops where passengers remain onboard. This relief is granted from the requirements found in GACAR § 121.753 for an airplane that more than one cabin crew member (CCM) is required.

**A. Boarding.** During the passenger boarding phase on each flight, all of the CCM required by GACAR § 121.753(a) must be on board the airplane, except as provided by GACAR § 121.757. Operators should review this regulation and ensure that all CCMs are trained in accordance with the specific provisions of this regulation. It provides for a reduction of one CCM provided:

- The airplane engines are shut down
- At least one floor level exit remains open to provide for passenger egress
- The number of cabin crew members on board is at least half the number required by GACAR § 121.753, rounded down to the next lower number in the case of fractions, but never fewer than one.

**B. Deplaning.** During the passenger deplaning phase on each flight, all of the CCM required by GACAR § 121.753(a) must be on board the airplane, except as provided by GACAR § 121.757. Operators should review this regulation and ensure that all CCMs are trained in accordance with the specific provisions of this regulation. It provides for a reduction of one CCM provided:

- The CCM that leaves the aircraft remains within the immediate vicinity of the door through which passengers are boarding
- The CCM that leaves the aircraft only conducts safety duties related to the flight being boarded

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- The airplane engines are shut down
- At least one floor level exit remains open to provide for passenger egress
- It also contains provisions to allow for substitution of a pilot or flight engineer provided certain requirements are met

**C. At Stops Where Passengers Remain On Board.** At stops where passengers remain on board the aircraft, all of the CCM required by GACAR § 121.753(a) must be on board the airplane, except as provided by GACAR § 121.757. Operators should review this regulation and ensure that all CCMs are trained in accordance with the specific provisions of this regulation. It provides for a reduction of one CCM provided:

- The aircraft engines are shut down
- At least one floor-level exit remains open to provide for the deplaning of passengers
- The number of cabin crew members on board is at least half the number required by GACAR § 121.753(a), rounded down to the next lower number in the case of fractions, but never fewer than one

**NOTE:** The operator may substitute for the required CCMs other persons qualified in the emergency evacuation procedures for that aircraft as required in GACAR § 121.907, if these persons are identified to the passengers.

**NOTE:** If only one CCM or other qualified person is on board during a stop, that CCM or other qualified person must be located as specified in the operator's approved operating procedures. If more than one CCM or other qualified person is on board, the CCMs or other qualified persons must be spaced throughout the cabin to provide the most effective assistance for the evacuation in case of an emergency.

### **D. Refueling With Passengers.**

- 1) *Part 121.* GACAR § 121.1259 requires a full complement of CCM (or other qualified person per GACAR § 121.757) be on board during the refueling process.
- 2) *Part 125.* Per GACAR § 125.469, if the number of cabin crew members remaining on

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board is fewer than required by GACAR § 125.339, the operator must meet the following requirements:

- The aircraft engines are shut down
- At least one floor level exit remains open to provide for the deplaning of passengers
- The number of cabin crew members on board is at least half the number required by GACAR § 125.339, rounded down to the next lower number in the case of fractions, but never fewer than one

**NOTE:** The operator may substitute for the required CCMs other persons qualified in the emergency evacuation procedures for that aircraft as required in GACAR § 125.341, if these persons are identified to the passengers.

**NOTE:** If only one CCM or other qualified person is on board during a stop, that CCM or other qualified person must be located in accordance with the operator's approved operating procedures. If more than one CCM or other qualified person is on board, the CCMs or other qualified persons must be spaced throughout the cabin to provide the most effective assistance for the evacuation in case of an emergency.

**4.27.4.3. DISTRIBUTION OF CABIN CREW MEMBERS.** GACAR Part 121 stipulates that CCMs must be uniformly distributed throughout the operation of the flight. This includes when the aircraft is in-flight, parked at the gate, moving on the surface, taking off, and landing. The most important part of this requirement pertains to placing CCMs in locations that will provide the most effective egress of passengers in the event of an emergency evacuation.

**A.** The purpose of this requirement is to avoid having several CCMs assigned to a sparsely occupied compartment when most of the passengers are grouped in another compartment having only one CCM.

**B.** Information regarding the required placement of CCMs for takeoff and landing should be included in the Operations Manual (OM). In that manual the operator must state how they will establish the CCM distributions for each aircraft type/configuration that they operate. The CCM distribution for each operator is included in the OM contents and must be approved by the principal operations inspector (POI) in operations specification (OpSpec) A7.

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C. POIs should not approve a change to the location of required CCM stations without the following actions:

- 1) Carefully analyzing the “request for a change” in order to determine that the assigned evacuation duties of the CCMs will meet the provisions of Part 121. Consideration to change the location of the required CCM stations should be based on changes in the cabin configuration such as number of seats, location of galleys, or CCM duties.
- 2) Consulting with the appropriate aircraft certification authorities should establish the reason for the location of the required CCM stations. In some aircraft, this location is quite critical while in others it may make little or no difference.
- 3) POIs should consider whether a partial evacuation demonstration, will be required by GACAR Part 121, if the CCM station is changed.

### **4.27.4.5. DUTY ASSIGNMENT OF REQUIRED AND NON-REQUIRED CABIN CREW**

**MEMBERS.** GACAR Part 121 requires that, during taxi, the CCM complement required by GACAR § 121.753, remain at their duty stations with safety belts and shoulder harnesses fastened, except to perform duties related to the safety of the aircraft and its occupants. All CCMs must keep their safety belts and shoulder harnesses fastened unless the CCM is performing duties related to the safety of the airplane and its occupants. GACAR § 125.339 contains similar requirements to those found in GACAR Part 121. Under both GACAR Part 121 and 125 the duties may include:

- Safety briefings
- Compliance checks of seat belt fastening
- Conducting passenger briefings
- Assuring passenger compliance with stowage of the food and beverage tray
- Assuring passenger compliance with the seat belt and no smoking placards/lights
- Checking for the proper stowage of carry-on baggage
- Attending distressed passengers

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- Responding to emergency situations

**A.** GACAR Part 121 and 125 states the requirements used to determine the minimum number of CCMs for each passenger-carrying aircraft operated by an operator.

**B.** The CCMs who make up the minimum complement, specified in the operator's OpSpecs, must be fully trained and qualified on that type aircraft.

1) Some operators may use only the minimum number of CCMs, while others occasionally or frequently use CCMs in excess of the number required. Except in the case described in subparagraph 2 below, the extra CCMs must be trained and qualified in accordance with GACAR Part 121.

2) A CCM in the process of meeting operating experience requirements would not yet be qualified and could not be used as a "required" CCM. GACAR Part 121 states, in part, "CCMs receiving operating experience may not be assigned as a required crew member." GACAR Part 125 does not contain a requirement for operating experience.

**C.** GACAR Part 121 and 125 does not require the use of extra or non-required CCMs. The capability to handle emergency situations and emergency evacuations is based on the complement of required CCMs. The duties assigned to the required complement of CCMs must be realistic, capable of being practically accomplished, and take into account the possible incapacitation of an individual crew member.

**D.** If an operator uses more trained and qualified CCMs than are required by GACAR Part 121, then the operator should have a procedure whereby the CCMs required to fulfill the regulatory requirements are appropriately assigned. The extra CCMs need to be identified.

**E.** The operator should evenly distribute extra CCMs. The operator's manual should contain procedures which identify the required and non-required CCMs. The operator should not assign duties to the extra CCMs who would mandate their presence and duty assignment in the event of an emergency situation such as an evacuation.

**4.27.4.7. USE OF NON-CABIN CREW MEMBER PERSONNEL IN AIRCRAFT CABINS.** If operators use company employees in the cabins of its aircraft for the purpose of conducting certain passenger service activities such as serving beverages, conducting customer relations, or acting as translators, it should be understood that these persons are not assigned to flights to perform safety

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duties.

- A. These company employees are not acting in the capacity of a CCM nor are they, in general, trained or qualified to act as a CCM.
- B. The regulations do not prohibit the use of non-CCM personnel by an operator. However, their presence could conceivably interfere with the CCMs, if they were not properly instructed. The following guidance should be considered when non-CCM personnel are used by an operator.
  - 1) *Status of Non-Cabin Crew Member Personnel.* Operators may use these individuals to perform activities limited to passenger service. They are a different category of cabin personnel and are not persons trained as CCMs.
  - 2) *Applicable Regulations.* Non-CCM personnel are subject to the same provisions of GACAR Part 121 as passengers. For example, they must receive a pre-takeoff briefing, they must be seated for movement on the surface, takeoff and landing, and they must stow their carry-on baggage as required by GACAR Part 121. They must also comply with the seat belt requirements of GACAR Part 121. They may not conduct any activities during movement on the surface.
  - 3) *Instruction.* These individuals should receive enough instruction so that they know what activities they may perform and equipment they may or may not operate so as not to interfere with the CCMs. If they operate equipment they must carry the applicable parts of the CCM manual. The appropriate parts of the manual should provide enough information to ensure that they understand their duties and procedures, and to ensure that they do not interfere with the CCM's duties and procedures.
  - 4) *Assignment of Activities.* The activities assigned to these individuals should be clearly distinguishable from the duties assigned to the CCMs. They should not be permitted to operate any equipment or systems for which specific training is required by Part 121 (e.g., electrical galley equipment, heating and ventilation controls for the cabin, and the public address system except to perform language translator duties for passenger briefings).
  - 5) *Identification of Non-Cabin Crew Member Personnel.* The operator may want to have these individuals distinguishable from the CCMs. That could be through the use of an identification card, a different uniform, or some other means.

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**NOTE:** The information in the preceding paragraph, although not regulatory should be considered by POIs when dealing with GACAR Part 125 operators that use other company employees to perform customer service tasks in the cabin.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 27. CABIN SAFETY AND CABIN CREW MEMBER SPECIAL EMPHASIS ITEMS FOR PART 121 AND 125**

##### **Section 5. Cabin Crew Member Qualifications**

###### **4.27.5.1. CABIN CREW MEMBER (CCM) OPERATING EXPERIENCE (PART 121 ONLY).**

General Authority of Civil Aviation Regulation (GACAR) Part 121 requires CCMs hold an appropriate and current CCM airman certificate issued by the President under GACAR Part 65, and that they must acquire operating experience (OE), per GACAR § 121.789(e). A CCM must, for at least 5 hours, perform the assigned duties of a CCM under the supervision of a CCM supervisor who personally observes the performance of these duties. This OE must be gained after satisfactory completion of the appropriate training and must be acquired during operations conducted under GACAR Part 121. Operating experience is required in order for CCMs to become fully qualified to serve in operations conducted under GACAR Part 121. Operating experience gives the operator the opportunity to familiarize qualifying CCMs with aircraft sounds and maneuvers associated with routine flight operations, emphasizing the normal time sequences available during flight, and provide the qualifying CCM trainee with practical experience in the performance of routine duties and procedures. Operating experience also provides the operator with the chance to ensure that the CCM is able to apply the lessons learned during basic indoctrination and initial training. Operating experience also gives the operator the opportunity to ensure that the trainee has the capabilities to qualify for CCM assignment of duties during a flight.

**NOTE:** GACAR Part 125 does not contain a requirement to conduct OE.

**A.** Operating experience must be gained after satisfactory completion of the appropriate training which includes basic indoctrination and initial training on the aircraft.

**B.** CCMs that have completed OE on any passenger-carrying aircraft operated under GACAR Part 121 are exempt from completing OE at another GACAR Part 121 operator, only if the CCM is to serve in the same group of aircraft, and the operator shows that the CCM has received sufficient training for the aircraft in which the CCM is to serve. In order for the CCM to receive credit for OE, the operator seeking this credit should have complete training records which clearly show the correct amount of OE time, the aircraft type, and the number of hours or OE on each aircraft type. If there is a reduction of OE time on the actual aircraft, then the reason for the

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reduction should also be part of the record. The principal operations inspector (POI) shall ensure that the training records are correct.

**C.** Operators should give OE during operations conducted under GACAR Part 121 on passenger-carrying, revenue flights; these flights must be representative of the operator's typical route and schedule structure. When possible these flights should consist of at least two takeoffs and landings.

**D.** Following completion of OE, the CCM trainees should participate in a debriefing, including a discussion of the safety duties they observed. As a minimum, the debriefing should include discussion of any check or use of emergency equipment, the passenger information briefings, passenger seat belt discipline, application of the carry-on baggage rule, crew coordination, and any unusual passenger handling situations.

**E.** Qualifying CCMs obtaining OE shall be assigned to the flight as a member of the cabin crew, but must be in excess of the minimum number of fully qualified CCMs (as listed in the operator's operations manual (OM)). Qualifying CCMs obtaining OE should not occupy a required CCM seat.

**F.** Qualifying CCMs receiving OE may not be assigned as a required crew member. However, qualifying CCMs obtaining OE should have the opportunity to practice all CCM duties while being supervised by an OE supervisor. Operators which operate aircraft having a requirement for one CCM, and are equipped with one CCM seat should consider having programs which provide (under supervision) the opportunity for newly qualified CCMs who have completed OE, to perform the duties of a CCM from the required CCM jump seat.

**G.** Some operators schedule large numbers of CCM trainees on flights to satisfy OE requirements. The number of trainees on a single flight often exceeds the number of fully qualified CCMs required by GACAR § 121.753. Operators that schedule an excessive number of qualifying CCMs for OE create an unrealistic environment. The number of qualifying CCMs receiving OE should not exceed the number of CCMs required by GACAR § 121.753, plus any additional, fully qualified CCMs that may be scheduled for that particular flight. These additional positions should be those that are listed in the operator's CCM manual as additional CCM positions with assigned duties. For example, the aircraft may have a requirement for three CCMs and the operator has provisions to assign a fourth CCM. The safety duties of this CCM must be listed in the CCM manual. In this example four qualifying CCMs obtaining OE should be scheduled.

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**H.** The regulations pertinent to OE require that qualifying CCMs obtain OE to perform the assigned duties of a CCM under the supervision of a supervisor qualified as a CCM under GACAR Part 121. The operator should designate the people permitted to perform this supervisory function. The supervising individuals must be experienced in the duties and responsibilities of the CCM and qualified to instruct and evaluate CCM trainees. These supervising individuals should be provided with additional training and/or guidance regarding conduct of OE flights. The supervisors must be qualified on the aircraft type. Information about qualified supervisors who can give OE should be included in the approved training program for each operator. The program should also include a description of the additional training and/or guidance which was given to these individuals.

**I.** New operators or operators which introduce new airplanes are unique in that there are not fully qualified CCMs. Such operators should staff an initial cadre of CCMs to act as supervisors while giving each other OE and conduct initial cadre CCM OE during the aircraft proving flights or ferry flights. The number of qualifying CCMs who receive OE on proving runs or ferry flights should not exceed the number of CCM who are assigned duties as listed in that operator's CCM manual for that particular aircraft. Qualifying CCMs who receive OE during the proving tests or ferry flights should be used to supervise other qualifying CCMs obtaining OE during scheduled operations.

**J.** When a reduction of aircraft OE time is granted (up to 50 percent), the time on the aircraft plus time spent practicing operations in an approved cabin mock-up should equal at least 5 hours. Regardless of where a CCM gains OE, either during an actual flight, in a cabin mock up, or in a static aircraft, the OE must occur after the successful completion of Initial New Hire CCM Training. The OE time in the cabin mock-up could be spent performing duties such as; use of the Public Address system, pre-flight briefings, safety announcements, and exit row seating and carry-on-baggage procedures. A full reduction to 2.5 hours of OE on the aircraft should be granted when the operator is equipped with a Level 5 cabin mock up and the POI determines the rest of the training program is of sufficient quality. Reductions should be based on the quality of the cabin mock-ups as determined by the POI.

- 1) The full scale cabin mock-ups and door training devices should be evaluated and approved by the POI as part of the operator's CCM training program. Approval of cabin mock-ups and door training devices is concurrent with approval of the entire training program for CCMs. The cabin mock-ups and door training devices must be listed in the operator's training program. If the operator chooses to use a static aircraft as a training

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device, it must also be listed in the operator's training program. If an operator uses an actual airplane for training, the POI should evaluate the training that is given in the airplane before allowing credit. The students should actually use the equipment and practice procedures normally expected of a required CCM during a flight. This is also the type of practice which should be performed in cabin mock-ups and door training devices.

2) The principle purpose of cabin mock-ups and door training devices is to provide realism during training for emergency situations. The POI must evaluate the operator's training program to determine that the procedures (i.e., amount of time, realistic inflight scenarios, and practice) are accomplished in the cabin mock-ups and through the use of other training devices, in order to approve a reduction in OE time. The POI shall provide documentation of the reasons for reducing the OE hours on the aircraft.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 27. CABIN SAFETY AND CABIN CREW MEMBER SPECIAL EMPHASIS ITEMS FOR PART 121 AND 125**

##### **Section 6. Operations - Cabin Safety**

**4.27.6.1. CARRY-ON BAGGAGE PROGRAM (PART 121).** Each GACAR Part 121 operator may not allow the boarding of carry-on baggage on an aircraft unless it has been scanned to control the size and amount being carried on board in accordance with an approved carry-on baggage program that must be specifically approved by the Principal Operations Inspector (POI) through issuance of Operations Specifications (OpSpecs) A11. Additional specific guidance is as follows:

**A.** General Authority of Civil Aviation Regulations (GACAR) § 121.1221(b), prohibits an operator from closing the passenger entry door in preparation for taxi or pushback, takeoff, or landing an aircraft unless each article of carry-on baggage is stowed in a suitable baggage or storage compartment under a passenger seat. Additional provisions regarding carry-on baggage are also found in GACAR § 91.51.

**B.** An operator may *not* allow the following:

- 1) The boarding of carry-on baggage unless each passenger's baggage has been scanned to control the size and amount carried on board in accordance with an approved carry-on baggage program. Additionally, no passenger may board an airplane if carry-on baggage exceeds the baggage allowance prescribed in the operator's approved program.

- 2) Unless all passenger entry doors of an aircraft to be closed in preparation for taxi or pushback at least one crew member has verified that each article of carry-on baggage is properly stowed. Baggage is neither properly stowed nor restrained unless the over-head bin door is closed and latched. The same requirements apply for stowing carry-on baggage before takeoff and landing.

- 3) Stowage of carry-on baggage or cargo that could hinder the use of any emergency equipment. Operators should provide suitable storage space for all required emergency equipment.

**C.** When operators allow the stowage of cargo and baggage in passenger seats, they should

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include this information in their approved carry-on baggage program. The information about this practice should include:

- The types of cargo that may be restrained in the seat
- Location of the seat(s) where it may be stowed

**D.** Carry-on baggage may be stowed against a passenger class divider or bulkhead if both are stressed for inertia loads and the baggage is restrained from shifting by approved tiedown straps or cargo nets. An Inspector must approve the stowage of carry-on baggage against the bulkhead or divider. Carry-on baggage may be stowed in coat closets or other compartments that are approved for this purpose.

**E.** The operation of an airplane with carry-on baggage, cargo, or trash stowed in uncertified receptacles, such as lavatories, is contrary to GACAR Part 121 and the certification basis of the aircraft. If a receptacle in the cabin of the aircraft, including the lavatory, is intended for the stowage of carry-on baggage, cargo, or trash, it must be shown to meet the applicable requirements in the aircraft certification basis. These requirements include:

- The structural requirements pertaining to the restraint of the receptacle's contents for flight, ground, and emergency landing load conditions
- Requirements pertaining to fire containment

**4.27.6.3. USE OF CHILD/INFANT RESTRAINT SYSTEM (CRS) IN AIRCRAFT.** The GACARs prescribe a performance standard that will satisfy aviation and highway safety requirements for child/infant restraint systems (CRS). The approval standard is defined in GACAR Part 91, Appendix C, Section IV, Child Restraint Systems. Additional child restraint requirements are found in GACAR § 121.1241. GACAR Part 121 and the requirements found in GACAR Part 91 require that “during takeoff, landing, and movement on the surface of an aircraft, each person on board shall occupy an approved seat or berth with a separate safety belt properly secured about them. However, a person who has not reached his second birthday may be held by an adult who is occupying a seat or berth.”

**A.** A person under the age of two may be held in an adult’s lap or placed in a regular passenger seat for takeoff and landing. However, because of the safety benefits, the General Authority of Civil Aviation (GACA) encourages the use of approved child/infant restraints aboard aircraft.

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**B.** Operator personnel, specifically cabin crew members (CCMs), should be aware of the following items pertaining to CRSs:

- The CRS should have a solid back and seat
- The CRS should have internal restraint straps installed to securely hold the child to the CRS
- The CRS should be labeled stating that it has been approved for aviation use, and
- The CRS should have instructions on the label which must be followed; (labels for approval from other countries are allowed and therefore may vary)

**C.** GACAR § 121.1241(a)(1), states that no operator may permit a child to occupy a booster-type child restraint system, a vest-type child restraint system, a harness-type child restraint system, or a lap-held child restraint system during takeoff, landing, and movement on the surface unless it meets the requirements of GACAR Part 91, Appendix C, Section IV.

**D.** Belly belts and vest type devices are not approved for use during takeoff, landing, and movement on the surface. These devices usually attach the child to the accompanying adult and could contribute to injuries when the adult rotates over his/her seat belt during deceleration. Other such devices tie the child to the passenger seat and since a solid back is not provided, the child may be injured when the back of the aircraft seat back rotates forward. Although some foreign airlines have approved the use of “belly belts” and other devices that do not have solid backs and solid seats, they are not approved for takeoff, landing, or movement on the surface.

**E.** Child restraint systems must be installed in forward facing aircraft seats, and in accordance with instructions on the label. This includes placing the child restraint in either a forward or aft facing direction in the passenger seat. The CRS should not be installed in the same row of an emergency exit or in the row forward or aft of an emergency exit. A window seat is the preferred location; however, other locations may be acceptable, provided the CRS does not block any passenger’s (including the parent or guardian of the child) egress to the aisle used to evacuate the aircraft. A responsible adult should occupy a seat next to the child.

**F.** The GACAR require operators to accept approved CRSs when the parent/guardian/attendant has purchased a ticket for their use.

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1) These regulations require operators to ensure that the child is properly secured in the CRS, the CRS is properly secured in a forward facing seat, the child does not exceed the weight limits of the CRS, and the CRS is approved and has the proper labels.

**G.** GACAR Part 91 requires that child restraint systems used on aircraft bear two labels: “This child restraint system conforms to all applicable Federal motor vehicle safety standards” and “THIS RESTRAINT IS CERTIFIED FOR USE IN MOTOR VEHICLES AND AIRCRAFT,” or must bear either a label showing approval of a foreign government, a label showing that the seat was manufactured under the standards of the United Nations, that the seat or child restraint device was approved by the Federal Aviation Administration (FAA) or the General Authority of Civil Aviation (GACA) through Type Certificate or Supplemental Type Certificate or a CRS that is specifically designed for use on aircraft under the performance standards of TSO-C100b (or a later version).

**4.27.6.5. PASSENGER SAFETY BELT DISCIPLINE (PART 121 AND 125).** Passengers unfastening their safety belts when the seat belt sign is illuminated is prohibited under the GACARs. The regulations require operators to illuminate the seat belt sign:

- Before movement on the surface
- During takeoff and landing
- At any other time when considered necessary by the pilot in command

**A.** Regulations also require all passengers to occupy their seat with their safety belt fastened when the seat belt sign is illuminated and to comply with crew member instructions regarding the “Fasten Seat Belt” sign.

**B.** When the seat belt sign is turned on, crew members should make an announcement. The announcement should emphasize that when the seat belt sign is illuminated, regulations require passengers to fasten their safety belts. In addition, as long as the sign is illuminated, crew members should periodically remind passengers that the seat belt sign is lighted. Crew members should make additional and forceful announcements if passengers stand and the seat belt sign is illuminated, especially during turbulent air operations.

**C.** Many passengers regard the illumination of the seat belt sign prior to landing as a signal to prepare for landing by going to the lavatory, standing, or stowing baggage. This is not a safe

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practice. Some crew members have adopted the desirable practice of making an announcement before turning on the seat belt sign for landing. They announce that:

- The flight will be landing shortly; now is the time to go to the lavatory or move about the cabin
- Once the seat belt sign is illuminated, passengers should be in their seats with their safety belts fastened

**D.** The regulations do not require all passengers to be seated before the passenger loading door is closed. Requiring passengers to be seated before the passenger loading door is closed is one way operators have chosen to obtain passenger compliance with the lighted seat belt sign. This is a good practice, but not one that the GACA requires.

**E.** Although not a part of the regulations, it is the policy of GACA that crew members should make an announcement when the seat belt sign is turned off in flight and that it is recommended that passengers keep their safety belts fastened when seated. The POI should emphasize the requirement for this announcement. In addition, POIs should encourage operators to establish additional procedures to emphasize the importance of passengers wearing their safety belts at all times when seated. These procedures could include:

- Additional announcements
- Video presentations
- Articles in operator publications or pamphlets in seat pockets

**F.** POIs should encourage operators to use announcement techniques that serve to forewarn passengers of pending situations that will require them to comply with the seat belt sign when it is illuminated. Examples of these situations include expected turbulence and approaching destination. These techniques should be designed to preclude any passenger movement once the seat belt sign is illuminated.

**G.** Coordination and communication between the flight crew members and the CCMs during all phases of flight is essential to aviation safety. POIs should ensure that their assigned operator's training programs and operational manuals contain the safe and effective procedures for coordination and communication between all crew members. These procedures should address:

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1) Guidance to flight crew members on the importance of a pre-departure briefing of the CCMs, which includes:

- Forecast turbulence related weather conditions
- Securing the galley and cabin
- Carry-on baggage
- Passengers
- Scheduling of cabin service and pick up

2) Use of the public address system or other signal to alert CCMs and passengers of anticipated inflight turbulence.

3) Guidance and specific signals to notify CCMs when they are to cease inflight services, secure galley, sit with their restraints fastened, and/or resume duties.

4) Guidance for CCMs regarding CCM determination that turbulence is too severe for the continuing of service and taking their seats with their restraints fastened and that they are to notify the flight crew members regarding this action.

5) Standardized notification to the flight crew from the CCMs when they complete all pre-takeoff and pre-landing duties and have secured the cabin.

6) Standardized signals from the flightdeck crew before takeoff and before landing, which they use to allow sufficient time for the CCMs to be seated.

**H.** Standup bars on wide-bodied operator aircraft have caused considerable concern for the safety of passengers when turbulence is encountered. On occasion, both passengers and CCMs have disregarded the seat belt sign when it was turned on and continued to congregate near the bar. This results in a potentially hazardous situation, not only for those passengers standing, but also for others seated in the area adjacent to the bar. From a safety viewpoint, whenever the seat belt signs are on, all passengers, including those in the vicinity of the standup bar, should be secured in their seats. Operators having standup bars installed in their aircraft should issue suitable instructions for the CCMs regarding safety belt discipline procedures.

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**4.27.6.7. EXIT SEATING PROGRAM.** GACAR Part 121 operators must comply with GACAR§ 121.1245 pertaining to exit seating.

**NOTE:** GACAR Part 125 does not contain specific exit seating requirements. The following information provides guidance and clarification on the development of the exit seating program and defines the applicability.

**A. Exit Seat.** An exit seat is defined as each seat in a row of seats through which passengers would have to pass to gain access to an exit from the first seat inboard of the exit to the first aisle inboard of the exit. A passenger seat having direct access means a seat from which a passenger can proceed directly to the exit without having to enter an aisle or pass around an obstruction (such as a bulkhead, lavatory, closet, galley, etc.).

- 1) The operator's manual procedures must contain a listing of designated exit seats for each type of passenger seating configuration in its fleet.
- 2) "Exit seat" is a more accurate term than "exit row." In some configurations involving a row of two seats at an exit, only one seat is behind a partition. (For example, the forward most row on the left side of the Dash-8.) The window seat, obstructed by the partition, is not considered an exit seat because the passenger does not have direct access to the forward left exit. However, the passenger seated next to that seat on the aisle has direct access because that passenger does not have to pass around the bulkhead to reach the exit. This is one of the rare exceptions whereby the entire row is not an exit row.

**B. Selection Criteria.**

- 1) As applicable to the exit seating rule, the required selection criteria for an occupant of an exit seat are listed in GACAR § 121.1245(b). The selection criteria are a listing of capabilities and conditions to be applied to determine the suitability of persons to occupy an exit seat.
- 2) The selection criteria should be contained in its entirety in the operator's manuals, including the CCM manual, and the exit seating passenger information card. The selection criteria must also be available for inspection by the public at all passenger loading gates. Operators should avoid paraphrasing the selection criteria, as it may change the meaning of the neutral selection criteria and result in unwarranted discrimination. An example of such

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paraphrasing whereby the meaning of the criteria is changed would be if an operator misrepresented GACAR § 121.1245(b)(4) as follows:

- a) “The person lacks sufficient visual capacity to perform one or more of the applicable functions.”
- b) The omission of “without the assistance of visual aids beyond contact lenses or eyeglasses” (as stated in the regulation) significantly changes the meaning of the criteria and could result in unwarranted removal of passengers with eyeglasses seated at exit seats. However, in some instances the regulatory language could be changed for simplification purposes without changing the meaning of the criteria. For example, “to exit expeditiously” could be restated as “to exit quickly.”

**C. Functions.** As applicable to the exit seating rule, GACAR § 121.1245(d) list the functions which a passenger, seated at an exit seat, must be willing and able to perform in the event of an emergency. The functions must appear on the exit seating passenger information card, but can be in written form or graphically displayed. The functions must also be contained in the written airport information available at the passenger loading gates and in the operator’s manual procedures.

**D. Seat Selection/Assessment/Verification Process.** Each operator, using the selection criteria, is required to determine the suitability of each person who occupies an exit seat. Regulations require that persons responsible for making this determination be identified in the operator’s manual. The operator is further responsible for developing procedures concerning this passenger selection process. The procedures should address:

- Who is responsible for making these determinations (prior to boarding and the final verification on board the aircraft)
- How they will make this determination
- When the process will be performed
- Where the process will be performed
- Identification of each designated exit seat (for each passenger seating configuration in its fleet)

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### 1) *Advanced Seating.*

a) To the maximum extent feasible, exit seats should be assigned prior to boarding the aircraft. This would reduce the confusion or requests for reseating and possible delays after the aircraft is boarded. This does not preclude an operator from having an open seating policy, advance seat selection, self check-in kiosks, or other type of computer/internet technologies which allows advance seating selection and check-in at airports where passengers may be permitted to select and be assigned an exit seat at check-in without screening by operator personnel. However, when these types of check-ins are in place, additional procedures should be developed and implemented for screening, verifying, and reseating passengers onboard the aircraft to ensure compliance with exit seat assignment requirements.

b) For example, menu prompts which appear at the point of exit seat selection could assist in preliminary verification of passenger eligibility. When a passenger has chosen an exit seat by means of a self check-in kiosk, the ground agent at the ticket lift point could make determinations and assessments at the time of passenger boarding. In order to safeguard the screening process, other carriers may select a “see agent” prompt at the point of passenger selection of exit seating via self check-in. POIs should ensure that when operators offer these methods of advanced seat selection, check-in, and open seating that approved exit seating programs provide ample information detailing the methods of screening and procedural safeguards in place to ensure compliance with exit seat assignment requirements.

2) The operator is responsible for identifying those persons who will make the determination as to the suitability of the person assigned to an exit seat. The responsibility can be assigned to a customer service agent, a crew member, or other persons specified by the operator in its company’s manual procedures.

3) Should operators choose to use electronic media that allows passengers to select exit seats and print out a boarding pass without going through an employee of the company, they must have procedures in place for screening those passengers. The individuals and the procedures used to accomplish this should be identified in the appropriate operator manuals.

4) While the regulation specifically defines the criteria for persons occupying an exit seat,

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the method by which the airline employee assesses the person assigned to an exit seat should be defined by the operator in its company's manual. This process generally requires a physical observation of the person and should require additional processes such as conversation with the person, to determine if he or she meets the selection criteria (ability to hear, understand, impart information, not distracted by other responsibilities such as caring for small children or other traveling companions, etc.).

5) GACAR § 121.1245(f) state that the operator may not taxi or pushback unless at least one required crew member has verified that no exit seat is occupied by a person the crew member determines is likely to be unable to perform the emergency functions. The required crew member and the method used to make this determination must be specified in the company's manual.

### **E. Individual Exit Seat Briefings.**

1) Many operators have procedures which designate certain crew members to conduct additional structured personal conversations or briefings, beyond the oral briefing required by GACAR § 121.1245(h), to ensure that the passengers in exit seats can hear, understand, and speak the language of the operator. (However, fluency in the language of the operator is not required as long as the exit seat passengers can understand crew instructions, commands, the graphic illustrations related to exit seat functions, and are able to adequately impart information related to emergency functions.)

2) Individual briefings that are given to passengers who occupy exit seats have a positive effect on the outcome of an aircraft evacuation. Individual briefings also assist CCMs in assessing the suitability of passengers who occupy those seats. An individual briefing reminds passengers of their exit seat responsibilities, gives them the encouragement to review their safety information card and also gives passengers the opportunity to ask the CCM any questions they may have about exit operation or procedures. This briefing also presents an opportunity for the CCM to assess the passengers' ability to understand oral crew commands.

3) POIs should strongly encourage their assigned operators to consider the safety benefits that are accomplished by individual exit seat briefings and to include such briefings in their predeparture procedures. In the absence of procedures that require individual briefings, POIs should ensure that each operator has a method in place to ensure compliance with

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GACAR § 121.1245(f), which requires verification by a required crew member that the passengers can perform all required functions, which includes the ability to follow oral directions.

**F. Assessment/Verification Prior to Landing.** Operators should also have procedures in place to ensure that exit seats are not occupied by persons who do not meet the exit seat criteria. Crew members should continue to monitor exit seat occupancy during flight, in the course of their normal duties, to ensure that persons who do not meet the criteria do not move into exit seats. In addition, crew members should recheck the exit seats before landing to make certain that passengers who met the criteria and occupied exit seats prior to takeoff still meet the exit seat criteria for landing (e.g., intoxication during flight, panic attacks, passenger illness or injury).

**G. Exit Seating Passenger Information Card.** GACAR § 121.1245(d) provides the requirement for the contents of the exit seating passenger information card. This exit seating passenger information card may be in addition to the standard passenger information card, which is required by GACAR § 121.1249(b) or it can be incorporated into the standard passenger information card. The exit seating passenger information card is required to be located at each designated exit seat. The exit seating passenger information card is to be presented in the primary language in which briefings and oral commands are given by the crew.

**H. Oral Briefing.** GACAR § 121.1245(h) and (i) provide the specific requirements for the oral briefing. The content of the required oral briefing must be part of the operator's manual procedures. As per the rule, the oral briefing shall:

- 1) Reference the exit seating passenger information card, along with the criteria and the functions. (The required oral briefing only requires a reference, not a reading of the contents of the criteria and functions.)
- 2) In addition, the briefing must have a statement that requests the passenger to identify his/her self for reseating if:
  - cannot meet the selection criteria
  - has a non-discernible condition that will prevent him/her from performing the applicable (emergency) functions
  - may suffer bodily harm as the result of performing one or more of the functions

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- does not wish to perform the functions
- 3) This briefing should be conducted after all the passengers have boarded. If the required briefing is conducted several minutes before the entry door is closed and then several late passengers' board after the briefing is completed, the briefing should be repeated in case one or more of the late passengers occupies an exit seat.
- 4) It is beneficial when the operator incorporates into the required oral briefing the exit seat locations for that aircraft configuration so the passengers seated at the exit seats clearly understand that the briefing requirements are directed toward them. Some operators further identify exit seat locations to passengers and crew with placards in the cabin, or with an indication on the passenger boarding pass.

### **I. Reseating/Full Booking.**

- 1) GACAR § 121.1245(i) requires that in the event that a passenger assigned to an exit seat would be unable to perform the evacuation functions, or requests a non-exit seat, the operator shall expeditiously relocate the passenger to a non-exit seat. The operator's manual procedures should clearly outline how the reseating would be accomplished.
- 2) GACAR § 121.1245(j) requires that in the event a passenger assigned to an exit seat wishes to be relocated to a non-exit seat and all of the non-exit seat are booked full, the operator must move a passenger from a non-exit seat to the exit seat who is willing and able to assume the evacuation functions. The operator's manual procedures should clearly outline how the reseating with a full load would be accomplished.

### **J. Denial of Transportation.**

- 1) GACAR § 121.1245(k) states that an operator may deny transportation to any passenger under this section only because:
- The passenger refused to comply with instructions given by a crew member or other authorized employee of the operator concerning the implementation of the approved exit seating procedures
  - The only seat that will physically accommodate the person's disability is an exit seat.

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2) The operator's manual procedures must describe the reasons for denial of transportation. It should also describe how it will be handled and who is designated to handle the situation.

**K. Disputes.** GACAR § 121.1245(l)(1) require that the operator include procedures which address how to resolve disputes arising from the implementation of this rule, and identify the employee on the airport to whom complaints would be addressed for resolution.

**L. Program Content for Submission.** The operator should submit the following documents to the POI:

1) *Manual Excerpts.*

a) Manual excerpts should be submitted from the operations, CCM, and passenger/customer service portions of the operator's manuals, with procedures appropriate for the operator's employees to adequately perform their exit seating duties and responsibilities.

b) The procedures should contain: the selection criteria, the emergency functions, location of designated exit seats, requirements for exit seating passenger information cards, crew member verification of appropriate seating in exit seats, passenger oral briefings, seat assignments, reseating, full bookings, assignment of exit seats, denial of transportation, resolving disputes arising from exit seating, and identification of the operator employee on the airport to whom complaints should be addressed for resolution.

2) *Configuration Diagrams.* These should be submitted (for evaluation) and should display each passenger seating configuration in the operator's fleet. The diagram should highlight all exit seats, all passenger exits, any obstruction, such as: bulkheads, lavatories, closets, galleys, etc.

3) *Exit Seating Passenger Information Cards.* Must be submitted for each type, make/model, and series aircraft. These cards may be submitted in draft form, pending final approval.

**M. Approval Process.** The POI is responsible for the exit seating review and approval process in regard to compliance with GACAR § 121.1245.

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- 1) Once the operator has completed their exit seating program package, a copy of the program should be forwarded in draft format to their POI. If the POI is not satisfied with the package, the POI will return it to the operator with an explanation of the changes/additions needed for the program. If the POI finds the program to be complete and satisfactory, the POI will then give the final approval to the operator and issue OpSpec A22.
- 2) Any subsequent revisions to the approved exit seating program, such as a change in procedures, an addition of new aircraft, a change in the passenger seating configurations, a change to the exit seating passenger information card, etc., must be sent to the POI.

**N. Special Approvals.** There may be situations whereby an operator may conduct some operations entirely in a foreign country. Such a situation could occur during a lease operation. The entire aircraft may be full of passengers who all speak one foreign language. The intent of the rule was not to exclude foreign speaking passengers from the exit seat, provided these passengers understand the commands given by the crew members in the event of an emergency, all the information on the approved exit seating passenger information card, and the required oral briefings. This may be accomplished in a number of ways. The crew members may be bilingual and trained in two languages, one of which is the language of the foreign passengers. The briefings may be conducted in two languages, the language of the foreign speaking passengers and the primary language of the operator. The exit seating passenger information cards should also be in the two languages. An amendment to the existing exit seating program would be needed which details the manner in which the operator would address this type of operation.

- 1) If the situation is such that the operation is conducted domestically and a large group of foreign speaking passengers aboard the aircraft speaking one particular foreign language, and board in such numbers that the only seats remaining for them are the exit seats, then the operator would need to develop special procedures for POI review and approval which would address this type of operation in order to comply with the rule.
- 2) If the operator cannot find any passengers who speak the language of the operator, then the operator should attempt to find those passengers who have some understanding of the language used by the operator in the domestic operations. In this situation it would appear that an interpreter would have to be used who is fluent in both the operator's primary language and the language of the foreign speaking passengers. An exit seating passenger information card would have to be developed in that foreign language and the interpreter would have to thoroughly brief the foreign speaking passengers on the contents of that

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specially approved exit seating passenger information card. The interpreter would also have to provide the required exit seating oral briefing in the foreign language to ensure that the exit seating passengers are willing and able to perform the emergency functions. The interpreter would have to review the commands, which would be given by the crew member in an emergency evacuation, in both the primary language of the operator and in the foreign language.

3) A designated crew member should oversee this special briefing and make the determination that those passengers understand their responsibilities, meet the criteria, and are willing and able to perform the emergency functions, if called upon to do so. This procedure requires more time to implement prior to departure and the necessary time must be allotted for this special briefing.

4) In these and other similar situations, the operator would need to develop, in advance of the operation, and submit for approval specific procedures, special exit seating passenger information cards in the foreign language to be used, and crew member training for that specific operation. The procedures must detail how the exit seating requirements would be met and who would be responsible for implementing the procedures and making the final determination as to the suitability of these passengers. The amended procedures must be sent to the POI for review. If the procedures satisfactorily meet the requirements, the exit seating program amendment for foreign speaking passengers can be approved by the POI.

### **4.27.6.9. EMERGENCY EVACUATION WITH INFANTS.** The most favorable methods for the emergency evacuation of infants from aircraft are as follows:

**A.** When dealing with an infant and an inflatable emergency evacuation slide it is strongly suggested that jumping onto the slide should be the favored boarding manner, as opposed to sitting down and sliding which slows the progress of the evacuation. The carrying position that provides the most protection for the child would include cradling the child's head and neck with the hand (for a vertical position) or in the arm (for horizontal positions), keeping the child's arms, legs, and feet enfolded as much as possible by the adult's arms. Both positions emphasize the importance of cradling the infant to protect its head, arms, and legs.

**B.** It is suggested that the most favorable method for evacuation of infants through a Type III overwing exit would be to carry the infant vertically, cradling the infant to protect its head, arms, and legs. Operators should recognize this practice as the favored egress maneuver through the

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Type III exit, as opposed to carrying the child horizontally or passing the child to another passenger on the outside of the Type III exit.

**C.** Operators are urged to review all research material available on line when developing procedures and practices to be used in this type of evacuation.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 28. AIR AMBULANCE AND REMS OPERATIONS**

##### **Section 1. Background and Definitions**

**4.28.1.1. INTRODUCTION.** This chapter provides information, direction, and guidance to be used by General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) when evaluating an air ambulance or rotorcraft emergency medical service (REMS) operator's procedures, Operations Manual (OM), or the unique requirements an operator must meet prior to being issued appropriate operations specifications (OpSpec). It also contains background information on air ambulance and REMS operations as well as specific crew training requirements and operational procedures. This section contains general background information, such as air ambulance OpSpecs and definitions of the terms used in this chapter.

##### **4.28.1.3. BACKGROUND.**

**A. Associations.** The association between aviation and the medical professions has formed a sophisticated system of life-sustaining care for ill or injured passengers using air transportation. Air ambulance and REMS operators have met the medical transportation need and demand by providing services and by equipping aircraft specifically for this purpose. GACA has specific OpSpecs paragraphs to clarify the means these operators will use to comply with safety and regulatory requirements while conducting air ambulance and emergency medical service operations.

**NOTE:** Situations will arise where bona fide medical emergency exists and no air operator with an air ambulance or REMS authorization is reasonably available. An operator without an air ambulance or REMS authorization may conduct an air ambulance or REMS operation to save a human life. That operator must file a written report with the President within 10 days, as required by General Authority of Civil Aviation Regulation (GACAR) §§ 91.3, 135.587, and 121.1129, as appropriate. The GACA will investigate the circumstances and determine if an actual emergency appeared to exist at the time of the operation. If not, action for non-compliance may be taken. Repeated air ambulance operations by an operator without an air ambulance authorization may be determined as holding out to the public to conduct an operation prohibited by its OpSpecs.

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**B. OpSpecs.** The OpSpecs developed by the GACA for air transportation of injured and medically ill patients consider the medical equipment, medical personnel, patient needs, type of aircraft, and the scope of operation in determining what constitutes an air ambulance operation or a REMS operation. OpSpecs for air ambulance operations (both airplanes and rotorcraft) may be issued for commercial air operations under GACAR Part 121 and 135 and non-commercial operations under GACAR Part 125. OpSpecs for REMS operations may only be issued for commercial air operations under GACAR Part 121 and 135.

**4.28.1.5. DEFINITIONS.** The following terms are defined according to their use in this handbook:

**A. Medical Personnel.** Persons with medical training who are assigned to provide medical care during flight.

**B. Air Ambulance.** An aircraft used in air ambulance operations. The aircraft may, or may not, be equipped with permanent medical equipment, and it need not be used exclusively as an air ambulance aircraft. Air ambulances, by definition, operate from and to established aerodromes.

**C. Air Ambulance Operation.**

- 1) Air transportation using an air ambulance of a person with a health condition that requires medical personnel, as determined by a health care provider, from aerodrome to aerodrome; or
- 2) Holding out to the public as willing to provide air transportation to a person with a health condition that requires medical personnel from aerodrome to aerodrome, including, but not limited to, advertising, solicitation, or association with a hospital or medical care provider.

**D. Local Flying Area.** An area designated by the operator in which rotorcraft emergency medical services will be conducted. Each local flying area should be defined in a manner acceptable to the operator and the Inspector, by taking into account the operating environment and geographic terrain features and capabilities of the aircraft.

**E. Response Scene.** The accident location to which an air ambulance has been dispatched for an air ambulance flight.

**F. Rotorcraft Emergency Medical Service (REMS) Operation.**

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- 1) The use of special, medically-equipped rotorcraft to provide crucial, safe, and efficient transportation of critically ill and injured patients from an accident site to a location where medical services can be obtained.
- 2) Rotorcraft used in REMS operations normally have permanently installed emergency medical equipment to support the purpose of the intended medical operation.

**4.28.1.7. OVERVIEW OF AIR AMBULANCE OPERATIONS.** Air ambulance operations have complexities not found in normal airplane or rotorcraft operations. As mentioned in paragraph 4.28.1.5 above, air ambulance operations take place from an established aerodrome to an established aerodrome. The flights may be scheduled or unscheduled and may be conducted with rotorcraft or with an airplane. However, they are conducted for the benefit of transporting patients with existing medical conditions from one medical facility to another facility using established aerodromes in the process. The aircraft normally do not have permanently installed medical equipment. GACAR § 91.416 requires all air operators desiring to conduct air ambulance operations to have authorization from the President, which is normally granted through issuance of an OpSpec. This paragraph provides a general overview of the types of air ambulance operations; however, details are contained in the appropriate paragraphs in this chapter.

**A. Rotorcraft Air Ambulance Service Operations.** Air operators conducting air ambulance services via rotorcraft are required to be authorized by the President through the issuance of OpSpec R124. Additionally, they must conduct all air ambulance operations in accordance with the operator's authorized procedures and manuals.

- 1) *OpSpec R124 Authorizations.* OpSpec R124 authorizes an air operator to conduct rotorcraft air ambulance medical transportation for patient transfer from medical facility to medical facility using operations at established aerodromes (including heliports). Weather limitations for visual flight rules (VFR) flight are normally included in these OpSpecs.

**B. Airplane Air Ambulance Service Operations.** This paragraph provides a general overview of airplane air ambulance operations, however, details are contained in the appropriate paragraphs in this section.

- 1) *OpSpec A24 Authorizations.* Airplane air ambulance operations do not differ significantly from other types of airplane operations. OpSpec A24 specifies operational requirements and grants the operator authorization to conduct airplane air ambulance service.

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2) *IFR Training.* Inspectors should encourage air ambulance operators to qualify all flight crews to conduct IFR operations even though some operators may be VFR only. The conduction of an instrument approach is mandatory for VFR operators as an emergency procedure during proficiency checks under GACAR § 135.349.

### **4.28.1.9. OVERVIEW OF ROTORCRAFT EMERGENCY MEDICAL SERVICES (REMS)**

**OPERATIONS.** REMS operations are granted to an operator through issuance of OpSpec R125. GACAR Part 91, Appendix D, Section VI addresses REMS operations, equipment requirements, communication, operating minima, performance requirements, flight crew member requirements, crew composition, crew training and checking, fatigue management, medical passenger and other personnel briefing, information and documentation, operating base facilities, fuel supply and refueling with passengers enplaning, on board, or deplaning. REMS operations have complexities not found in airplane or rotorcraft air ambulance operations. This paragraph provides a general overview of some of those complexities; however, details are contained in the appropriate paragraphs in this chapter.

#### **A. Operational Factors.**

1) *Higher Minimums.* The authorization to conduct REMS operations is based on the operator's use of higher ceiling and visibility minima in uncontrolled airspace than are required for conventional operations.

2) *Night Landings.* Night landings at unimproved sites are permitted with adequate lighting for the pilot to identify the landing site and surrounding hazards.

**NOTE:** “Adequate” lighting is lighting that allows a rotorcraft pilot to conduct a safe approach and landing during conditions of darkness while avoiding terrain and obstacles. The source of this lighting may be on the rotorcraft or on the surface and includes the possibility of automobile lights being used to illuminate the landing site. Pyrotechnic road hazard flares are not recommended for marking the touchdown area.

3) *Local Flying Area.* The operator must define and fully describe a local flying area for each base of operation, or enter a reference to the appropriate OM page in OpSpec R125. The local area should not exceed 100 nautical miles from the dispatch location, taking into account man-made and natural geographic terrain features that are easily identifiable by the Pilot-In-Command (PIC), and from which the PIC may visually determine a position at all times.

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4) OpSpec R125 grants latitude to a REMS operator for landing site selection as well as the authority to land on appropriate sites during both day and night in REMS operations.

**B. Instrument Flight Rules (IFR) and VFR Requirements.** Operators of REMS operations must comply with the following requirements for IFR and VFR:

1) *IFR Operations.* The REMS operator's procedures, training and qualification program, and its operating environment should be evaluated before granting the operator the authority to conduct single-pilot IFR operations with an autopilot.

2) *VFR Operations.* The REMS operator must comply with the VFR weather minima, as specified in OpSpec R125, unless the operator can demonstrate to the GACA that compensating factors are utilized to ensure that operations to lower minima can be accomplished safely.

3) *Training for Stress-Related Issues.* Flight crews may experience high stress levels in REMS operations due to the potential urgency for responding to emergencies related to preserving human life. Inspectors should ensure that operators give adequate attention to Crew Resource Management (CRM) training to prevent inappropriate actions and decisions during periods of stress. One acceptable means operators may use to guard against stress-related issues is to require that the medical crew and the PIC agree that the flight can be safely initiated and continued under the present conditions.

**C. Flight and Rest Time.** Operators may choose to schedule crews under one of several rules, depending on the specific type of operation. In some cases, operators may conduct operations at different locations under different rules. The operator's OM must contain the specific method to be used and how records are to be kept to show compliance with the rule used.

### 4.28.1.11. OPERATORS REQUESTING AIR AMBULANCE OPSPECS.

**A. Regulatory Requirements.** An air ambulance operator must comply with all requirements of the GACAR part under which the operator is certificated. Air ambulance operators are not exempt from any requirement of the GACARs by reason of conducting air ambulance operations. To ensure standardization in the air ambulance industry and a clear understanding between the GACA and air ambulance operators, OpSpecs A24 and R124 contain the specific means by which air ambulance operators can comply with the GACARs while conducting air ambulance operations.

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**B. Certification under a GACAR Part.** GACAR Part 119 specifies the GACAR part used to certify an operator based on the type certification category for the aircraft the certificate holder operates. An air ambulance operator must be certified under GACAR Part 121, Part 125 or Part 135 and comply with all provisions of the part under which the operator is certified. The carriage of a person or persons requiring medical attendants and/or medical oxygen on a flight under GACAR Part 91, 121, 125 or 135 does not constitute air ambulance operations. However, the transport of a person or persons requiring specialized medical personnel for their care and/or medical equipment is considered to be engaged in air ambulance operations.

**C. Operators Requesting Air Ambulance OpSpecs Paragraphs.** All operators are initially prohibited from conducting air ambulance operations by OpSpec A4. Those who desire to advertise and/or conduct air ambulance operations must have the prohibition removed through the issuance of the appropriate air ambulance OpSpecs paragraph. Operators holding OpSpecs without paragraphs A24 or R124 may transport medical personnel as passengers who are accompanying a sick or injured person, but must meet the following requirements:

- 1) They may not advertise air ambulance or in-flight patient care services.
- 2) Any in-flight patient care equipment and medical personnel that accompany the passenger must be provided solely for the patient's comfort. If any medical care provider has determined that medical personnel are required for the patient's health and safety, the flight is an air ambulance operation.

**D. Operators Requesting a Rotorcraft Emergency Medical Services (REMS) OpSpecs Paragraph.** Under the GACAR, all commercial air ambulance operators who want to conduct REMS operations must obtain an authorization from the President. This authorization is issued as a separate paragraph in the air operator's operations specifications and is in addition to the Air Ambulance paragraph described above for the type of operation being conducted. REMS is classified as a special flight operation under GACAR Part 91 and the process and requirements for obtaining a REMS authorization is described in GACAR Part 91, Subpart D, Section VI.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 28. AIR AMBULANCE AND REMS OPERATIONS**

##### **Section 2. Authorizing Air Ambulance and REMS Operations**

**4.28.2.1. GENERAL.** This section contains guidance to be used by General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) when evaluating an operator's request to be issued operations specifications (OpSpecs) for Rotorcraft Air Ambulance Operations (OpSpec R124), Airplane Air Ambulance Operations (OpSpec A24), or for Rotorcraft Emergency Medical Services (REMS) Operations (OpSpec R125).

**A. Certification of New Operators.** The GACA may receive a request from a person who does not currently hold a certificate issued under General Authority of Civil Aviation Regulation (GACAR) Part 119 to be certified with an air ambulance or REMS authorization. In this case, Inspectors should follow the guidance listed in subparagraph below. Inspectors should refer to Sections 3 and 4 of this chapter to obtain policies, direction, and guidance for evaluating an air ambulance or REMS operator during Phases Two, Three, and Four of the certification process.

**B. Relevant Documents.** The Inspector conducting a certification or recertification of an air ambulance or REMS operator should become familiar with the contents of the following documents and should bring these documents to the attention of the operator:

- Volume 1, Chapter 4, The Generic Approval Or Acceptance Process For Specific Operations, Programs And Documents
- Volume 3, Chapter 2, General Certification Information
- Volume 3, Chapter 3, The Certification Process for Part 121
- Volume 3, Chapter 4, The Certification Process for Part 125
- Volume 3, Chapter 6, The Certification Process for Part 135
- Volume 15, Chapter 1, General Information
- Volume 15, Chapter 3, Part 121 – Operations Specifications

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- Volume 15, Chapter 4, Part 125 – Operations Specifications
- Volume 15, Chapter 6, Part 135 – Operations Specifications
- GACAR 91, Appendix D, Section VI, REMS Operations
- Federal Aviation administration (FAA) Advisory Circular (AC) 135 14A (as amended), Emergency Medical Services/Helicopter (EMS/H).

### **4.28.2.3. EXISTING OPERATORS INITIATING AIR AMBULANCE OR REMS**

**OPERATIONS.** Existing operators may request that Inspectors issue OpSpec A24, R124, or R125, as appropriate. Inspectors should consider a request to conduct air ambulance or REMS operations a potentially significant change in the operator's operation and should use the following direction and guidance when issuing OpSpec A24, R124, or R125, as applicable

#### **A. Pre-Application Phase.**

- 1) Inspector and the operator should meet to decide what documents the operator must create or modify and what proving flights or validation tests the operator must conduct. The Inspector should coordinate with an Inspector (Airworthiness) when scheduling this meeting.
- 2) The Inspector should inform the operator of the requirement to prepare a new compliance statement. The operator should review each rule of GACAR Part 91, 121, 125 or 135, as appropriate, and indicate those rules under which changes in the operator's compliance procedures will be required while conducting air ambulance and/or REMS operations. For those rules requiring no change, the Inspector may accept a simple statement such as, "No change".
- 3) The Inspector should review the applicable air operator certification section of this handbook to determine the actions required.
- 4) The Inspector and the operator should come to a mutual agreement on the documents that the operator will be required to provide or modify.
- 5) Specific areas that should be reviewed include the following:

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- Development of the air ambulance or REMS procedures section of the operator's Operations Manual (OM)
- Development of an aircraft flight manual and checklists appropriate to air ambulance or REMS operations
- Development of the air ambulance or REMS section of the operator's training and qualification program
- Equipment installation; medical oxygen, suction, Isolette or other patient restraint/containment device, and stretcher

**B. Formal Application Phase.** The operator must submit a letter requesting issuance of the appropriate OpSpec paragraphs, the new compliance statement, and those attachments referred to in the applicable certification chapter, which have been determined to be applicable in the previous phase.

**C. Document Compliance Phase.** Inspectors should review all applicable documents for compliance with the GACARs and GACA policy.

**D. Demonstration and Inspection Phase.** In this phase, only the applicable events of the certification job aid have to be accomplished. Since unique circumstances surround each certification, the Inspector must informally coordinate with the any applicable departments of the GACA before closing this phase. These demonstrations include but are not limited to the following:

- Training in air ambulance and/or REMS procedures
- Emergency evacuations
- Air navigation under air ambulance and/or REMS operating procedures
- Operational control procedures

**E. Certification Phase.** Once the Inspector is satisfied that all of the requirements have been met, the applicable OpSpecs may be issued to the operator.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 28. AIR AMBULANCE AND REMS OPERATIONS**

##### **Section 3. Operational Procedures for Air Ambulance and REMS Service**

**4.28.3.1. GENERAL.** This section contains information and guidance to be used by General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) when evaluating a General Authority of Civil Aviation Regulation (GACAR) Part 121, 125 or 135 operator's special operational procedures for air ambulance or rotorcraft emergency medical service (REMS) operations. This section covers the evaluation of an operator's administrative, preflight, in-flight, emergency, and post flight procedures. To conduct air ambulance or REMS operations, an operator must comply with all of the pertinent requirements of GACAR Part 91, 121, 125 or 135, as applicable, as well as meet certain requirements for the issuance of air ambulance or REMS operations specifications (OpSpecs).

**4.28.3.3. ADMINISTRATIVE PROCEDURES.** When evaluating an air operator's administrative procedures for air ambulance or REMS operations, Inspectors should consider the following:

**A. Operational Control Procedures.** Inspectors should ensure that an operator's procedures for operational control are adequate for the operator's base of operations and for each satellite location. In an air ambulance or REMS operation, the pilot in command (PIC) exercises final authority to initiate, conduct, or terminate an assigned flight.

**B. Flight Time and Rest Requirements.** Inspectors should ensure that an operator maintains well-defined records showing the difference of flight time, rest time, and off duty or unassigned time in accordance with the appropriate GACAR sections which address crew member flight time, duty period limitations, and rest requirements. Air ambulance and REMS operators operate under the following regulations:

1) *Air Ambulance Operations.* Flight time and rest requirements for air ambulance operations are unchanged from the applicable fatigue management requirements prescribed in Subpart N of GACAR Parts 121, 125 or 135.

2) *REMS Operations.* Flight time and rest requirements for REMS operations are contained in GACAR Part 91, Appendix D, Section VI, REMS Operations. Inspectors should ensure that operators scheduling REMS operations have identified the procedures and policies of

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GACAR Part 91, Appendix D, Section VI in their operations manual (OM).

**C. Flight Locating Procedures.** To ensure the safe and orderly accomplishment of an air ambulance or REMS service mission, each operator should develop a flight locating system. Air ambulance and REMS operations should be conducted using instrument flight rules (IFR) and visual flight rules (VFR) flight plans and procedures, when feasible. There must be flight locating procedures for making the determination of when an aircraft is overdue. The operator's procedures must contain specific actions that are necessary when an aircraft is overdue in the situation. Elements that should be considered by Inspectors when evaluating flight locating procedures include the following:

- 1) Procedures that provide the operator with all the information required to be included in a VFR flight plan.
- 2) Procedures that provide for the timely notification of a search and rescue facility, if an aircraft is overdue or missing (Ensure that a flight following or locating facility has a trained, dedicated person monitoring the radios with written instructions to follow in the event of an overdue or lost aircraft).
- 3) Procedures that provide the operator with the location, date, and estimated time for reestablishing radio or telephone communications if the flight will operate in an area where communications cannot be maintained.
- 4) Communication procedures ensuring that actual departure times are transmitted to the flight-locating facility.
- 5) Procedures ensuring that position reports are made at specified intervals and are received by the flight-locating facility.

**NOTE.** If a hospital dispatcher is used for flight locating, ensure that the dispatcher has written emergency procedures for reestablishing contact with the aircraft and for notification when the aircraft is overdue. If the medical facility does not have an assigned dispatcher, determine where the flight locating radio is located and who has responsibility for monitoring it. A radio in a common area answered by the nearest person is not acceptable.

- 6) Adequate training on the operator's flight locating procedures for persons assigned flight tracking duties at the operator's flight locating facility
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**D. Shift Change Briefing.** Inspectors should ensure that the operator has a procedure to ensure that the flight crew members coming on duty have received information concerning the following:

- 1) Aircraft status (such as fuel, maintenance discrepancies)
- 2) Anticipated flights
- 3) Hazard updates
- 4) Schedule changes
- 5) Name and location of relief pilot
- 6) Any other special circumstances

**E. Potential Hazard Information.** Inspectors should ensure that rotorcraft operators have developed a means at each base and satellite location for depicting uncharted hazards (to include the location of wire hazards) in the local flying area that may impair low flight or off site landings. Operators should have established procedures for keeping this information current.

**F. Landing Site Depiction.** Inspectors should encourage operators to provide a portfolio, notebook, or other media containing photographs, videos, drawings, or diagrams of each of the heliports used routinely by the operator. Operators should update this information regularly and keep it available as preflight information. In the event the landing site is not routine, the operator is encouraged to establish adequate procedures for landing, to include air and ground reconnaissance prior to landing.

**G. Protection and Control of Infectious Conditions.** Air ambulance and REMS operators should have procedures in their operations manual for the disposal and decontamination of medical or hazardous wastes. Air ambulance and REMS operators should also have procedures in their operations manual for infection control and for aircraft cleaning, which may be provided by an associated medical service or hospital or could be contracted to a service company. Inspectors should ensure that precautions for all of the operator's employees are emphasized in the operations manual.

### 4.28.3.5. PREFLIGHT PLANNING. When evaluating an air operator's preflight planning

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procedures for an air ambulance or REMS service, Inspectors should consider the following:

**A. Use of Local Flying Area Maps for Rotorcraft Operations.** In addition to the items normally accomplished during preflight planning, the PIC should become familiar with the current map of the area and the uncharted hazards for the area.

- 1) *Weather Considerations.* Weather considerations include the capability for obtaining current weather information for the area of operation at the time of the planned flight.
- 2) *Landing Site Update Information.* The PIC should review the operator's updated landing site portfolio for current operational information.

**4.28.3.7. IN-FLIGHT PROCEDURES.** When evaluating an operator's in-flight procedures for an air ambulance or REMS service, Inspectors should consider the following:

**A. Passenger Briefing Procedures.** A person designated and trained by the operator may conduct the passenger briefing required by the GACAR. If passenger briefing duties are delegated to a medical crew member, the procedure must be covered in the operator's operations and training manuals. As in all GACAR Part 121 and 135 passenger-carrying operations, passenger briefing cards are required for air ambulance and REMS operations.

**B. Passenger Restraint Procedures.** Operators should be encouraged to establish adequate written procedures for the proper restraint of all flight personnel and the proper use of seat belts and shoulder harnesses during air ambulance and REMS operations. In addition, it is the responsibility of the PIC to ensure that passengers who may pose a hazard to the aircraft or to its occupants are properly restrained before takeoff (such as hysterical patients or combative passengers.)

**C. Air-to-Ground Communications.** Rotorcraft used in REMS services must have air-to-ground communication systems that ensure the safe and satisfactory completion of the flight. These systems must ensure that the flight crew can coordinate with emergency personnel on the scene (such as police and fire departments, when applicable).

**D. Scene Response Operations.** The term scene response is normally associated with REMS operations. Inspectors should consider the following operational procedures regarding scene response operations:

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1) Operators should have established procedures for in-flight coordination with local authorities. The PIC should establish communication with scene personnel (such as the local authorities and fire departments, when applicable) as soon as possible after takeoff. A REMS flight in a remote area with an adequate landing site should attempt to relay communications through all available communication channels.

2) The operations manual should have procedures for determining the suitability of the landing site, which should include the following:

- Obstacles
- Crowd control
- Security
- Wind direction and velocity
- Restrictions to visibility
- Illumination of obstacles by ground personnel at night

3) The PIC must be aware that personnel on the ground may not have been trained to provide the PIC with accurate information from which the PIC can determine the suitability of a landing site. The final responsibility for the determination of the suitability of the landing site remains with the PIC.

4) After a scene response landing, the PIC should refrain from getting involved with patient care. If the aircraft's engines are not shut down, the PIC should remain at the designated aircraft station and evaluate the takeoff area to predetermine a safe departure. If the engines are shut down, the PIC should make a physical reconnaissance of the intended departure path to determine the location of all obstacles.

**NOTE:** Aircraft station would be the assigned area of responsibility in or around the aircraft during a scene response that would allow the pilot to keep the public and emergency personnel from straying into a danger zone.

5) The PIC is responsible during scene response operations for ensuring that the operator's

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safety procedures are complied with for movement in and around the aircraft, including loading and unloading.

- 6) The operations manual should have specific policy guidance for coordination procedures between flight crew and medical personnel.

**4.28.3.9. EMERGENCY PROCEDURES.** When evaluating an operator's emergency procedures for an air ambulance or REMS service, Inspectors should consider the following:

**A. Inadvertent Instrument Meteorological Conditions (IMC).** Operators must have emergency operational procedures for recovery from inadvertent IMC. These procedures must be in the operator's training manual.

**B. In-Flight Medical Emergencies.** For in-flight medical emergencies, operators need procedures for flight crew coordination with medical personnel. The PIC must be able to remain excluded from the medical emergency.

**NOTE:** Inspectors should encourage operators to include in their training program a course for pilots on exercising good judgment in crises.

**C. Emergency Evacuation Procedures.** Operators must develop emergency evacuation procedures for each make and model of aircraft and aircraft configuration used for a medical services flight. This should include any additional duties assigned to the medical crew.

**4.28.3.11. EFFECT OF LIGHTING ON SEEING CONDITIONS IN NIGHT VFR REMS OPERATIONS.** While ceiling and visibility significantly affect safety in night VFR REMS operations, lighting conditions also have a profound effect on safety. Even in conditions which are determined by visibility and ceiling to be visual meteorological conditions, the ability to discern unlighted or low contrast objects and terrain at night may be compromised. The ability to discern these objects and terrain is the seeing condition. It is related to the amount of natural and man-made lighting available, and to the contrast, reflectivity, and texture of surface terrain and obstruction features. In order to conduct operations safely, seeing conditions must be accounted for in the planning and execution of night VFR REMS operations.

**A. Regulatory Requirements.** The regulatory requirements for lighting for night VFR REMS operations under GACAR Part 135 are contained in GACAR § 135.655. "No person may operate a rotorcraft under VFR unless that person has visual surface reference or, at night, visual

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surface light reference, sufficient to safely control the rotorcraft.” Regardless of the weather minima or the use of advanced technologies, this requirement must be met in all VFR rotorcraft operations conducted under GACAR Part 135. For night VFR REMS operations under GACAR Part 121 this requirement is added to the OpSpec limitations.

1) Operations Specification (OpSpec) R125 provides for the consideration of lighting conditions and terrain environment in determining the minimum ceiling and visibility for operation. In OpSpec R125, lighting conditions are identified as high lighting conditions and low lighting conditions. Sources of lighting include natural celestial illumination (stars and moon) and surface lighting (manufactured lighting sources).

a) High lighting conditions exist when one of two sets of conditions are present:

1. The sky cover is less than broken (less than 5/8 cloud cover), the time is between the local moonrise and moonset, and the lunar disk is at least 50 percent illuminated.
2. The aircraft is operated over surface lighting, which at least provides for the lighting of prominent obstacles, the identification of terrain features (shorelines, valleys, hills, mountains, slopes), and a horizontal reference by which the pilot may control the rotorcraft. For example, this surface lighting may be the result if:

- Extensive cultural lighting (manufactured lighting, such as a built-up area of a city)
- Significant reflected cultural lighting (such as the illumination caused by the reflection of a major metropolitan area’s lighting reflecting off a cloud ceiling)
- Limited cultural lighting combined with a high level of natural reflectivity of celestial illumination, such as that provided by a surface covered by snow or a desert surface

b) Low lighting conditions are those that meet neither set of high lighting conditions requirements

c) The pilot is responsible for determining which level of lighting is expected or

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observed along a flight path, and hence, for which minima apply. For example, a particular area, such as a built up area of a city, may be adequately lighted to support high lighting conditions regardless of celestial illumination sources. Some areas may be considered a high lighting environment only in specific circumstances. For example, some surfaces, such as a forest with limited cultural lighting, normally have little reflectivity, requiring dependence on significant moonlight to achieve a high lighting condition. When that same forest is covered with snow, however, its reflectivity may support a high lighting condition based only on starlight. Similarly, an area with little cultural lighting, such as a desert, may have such inherent natural reflectivity that it may be considered a high lighting condition area regardless of season, provided the cloud cover does not prevent starlight from being reflected from the surface. Other surfaces, such as areas of open water, may never have enough reflectivity or cultural lighting to ever be characterized as a high lighting area.

- d) Through the accumulation of night flying experience in a particular area, the air operator will develop the ability to determine, prior to departure, which areas can be considered as supporting high or low lighting conditions. Without that operational experience, air operators for both preflight planning and operations should apply low lighting minima until high lighting conditions are observed or determined to be regularly available.
- 2) In addition, OpSpec R125 provides for higher minima in mountainous areas than in non-mountainous areas due to the additional risk of precipitous terrain.

**B. Authorization.** The criteria for authorizing the use of night vision imaging systems (NVIS) is found in GACAR Part 91, Appendix D, Section VIII. The operator must meet the criteria established there and have a specific authorization for use of NVIS during REMS operations issued as part of the operator's OpSpecs.

**C. IFR Operations.** Operators authorized to conduct IFR operations in accordance with their OpSpecs may also use the high lighting condition minima during low lighting conditions.

- 1) This authority to use the high lighting condition minima is predicated on the pilot employing the stabilization augmentations required for IFR flight (stability augmentation systems, flight director, and/or autopilot). By employing these systems, the pilot workload in basic flying tasks is reduced. This reduction in basic piloting workload will allow the

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flight crew to devote more attention to communications, navigation, obstacles, terrain, weather monitoring, and weather interpretation, thus resulting in better aeronautical decision-making.

- 2) Additionally, this authorization is based on the expectation that by being IFR capable, these air operators have less exposure in transitioning to IFR in the event of encountering deteriorating weather or seeing conditions. This applies only to aircraft and pilots authorized to conduct IFR operations.
- 3) To apply this authorization, the minimum required flight crew for IFR flight must be used, and the aircraft must be appropriately equipped and operated using the stabilization, flight control system(s), and system modes required and operable for IFR flight. The selection of coupled autopilot modes, if any, will depend on the operating environment, and are at the discretion of the pilot. For example, the use of altitude hold coupled autopilot mode may be inappropriate for operations in an area of hills or in mountainous terrain. In this case, the use of a flight control system attitude retention mode may suffice to reduce workload.

**D. Lighting Level.** Operators may choose to disregard lighting level for night operations for planning and operations provided they apply the low lighting condition minima for all night operations, using the mountainous or non-mountainous minima as appropriate. In such cases, the high lighting minima must not be authorized in OpSpec R125.

**4.28.3.13. LOCAL FLYING AREA FOR REMS OPERATIONS.** The local flying area is considered that area of which the pilot has detailed local knowledge.

**A. Local Flying.** The local flying area may be a symmetrical area, such as an area encompassed by a designated size radius, or landmarks and geographical features may define it. However, these features must be individually identified for each base of operations.

- 1) An acceptable local flying area is an area that the pilot can identify in flight, and for which the pilot's operational knowledge can be evaluated through an oral or written test.
- 2) Exceptions can be approved when the area has limited complexity; however, in no case should a local flying area exceed 50 nautical miles in any direction from the REMS base.

**B.** Any number of references may define the local flying area:

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- A specified radius from a point (if easily identified using installed and operational avionics)
- Bounding natural and cultural references (rivers, shorelines, roads, highways)
- Governmental boundaries, if easily identified in flight
- By describing a polygon between natural, cultural, or aeronautical reference points (shoreline points, islands, valleys, buildings, airports, VHF omnidirectional range station (VOR)s, RNAV waypoints)
- Any other reasonable description of an area that may be easily applied by a flight crew, such as a predetermined route, or system of routes
- Limitations to any of the above (Example: 25-nautical mile radius of the local hospital, except that portion west of Any Wadi)

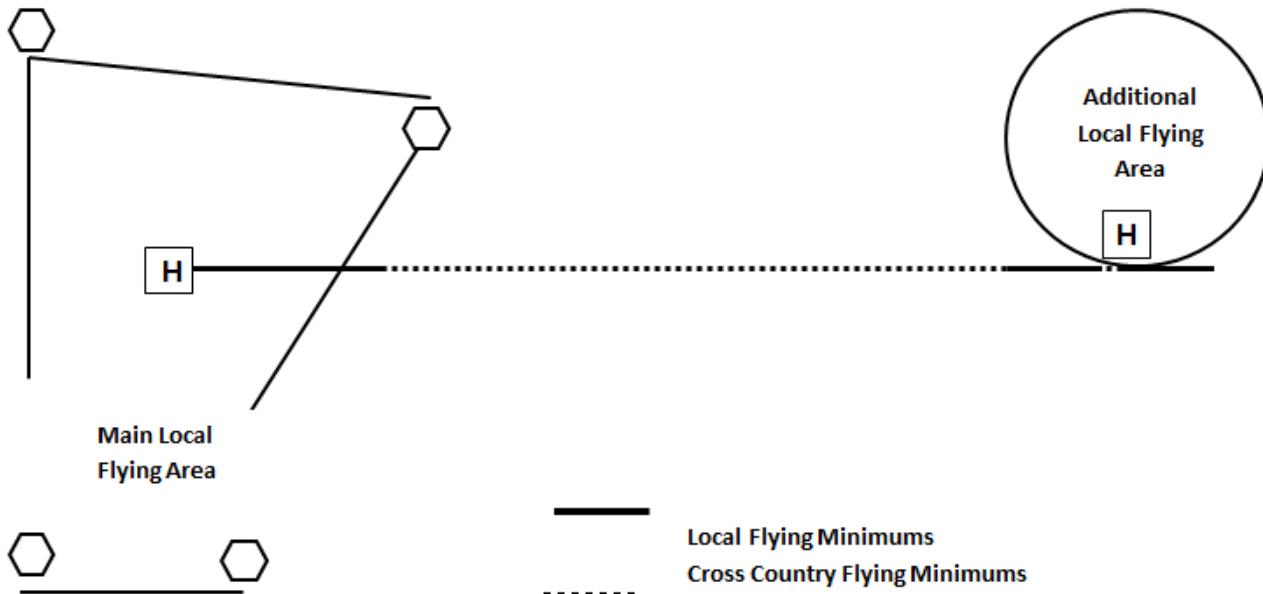
**C. Contiguous.** The local flying area is not required to be contiguous, that is, there is no requirement that the local flying area for a particular base of operations be only one defined area. For example, if the operator conducts REMS operations in a particular metropolitan area, but often transports patients to a regional trauma center outside that area, the operator may choose to develop an additional local flying area for the assigned pilots to use when operating near the trauma center. While operating in between the local flying areas, the cross-country minima would apply (see Figure 4.28.3.1).

**Figure 4.28.3.1. Local and Cross Country Flying Minima**

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**D. Flying Area Minima.** In order to use the local flying area minima provided in OpSpec R125, a REMS pilot must have completed an examination on the features of the local flying area with the previous 12 calendar months. This examination must include, but is not limited to the following:

- Terrain features
- Prominent obstructions, including areas of obstructions
- Minimum safe altitudes in the area
- Weather producers (such as industrial areas, fog prone areas, etc.)
- Areas of poor surface lighting, and the effects of seasonal and other changes on surface lighting, as applicable to the local flying area in question
- Airspace/air traffic facilities
- Radar and communications coverage, including minimum altitudes for radar service and communications with air traffic facilities and company dispatch/communications facilities

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- Aerodromes/heliports/fuel sources, including night availability
- Available instrument approaches
- Predominant air traffic flows
- Landmarks and cultural features
- Noise sensitive areas
- Facility-specific information, such as flight locating, dispatch, and communications
- Any emergency considerations appropriate to the area
- If a pilot has not satisfactorily passed an examination on the applicable local flying area, he must use the cross-country area weather minima
- Additionally, OpSpec R125 provides different minimums for mountainous and non-mountainous areas

**NOTE:** This examination may be an oral or written examination, or combination, and may be conducted as a part of the line check conducted under GACAR Part 121 or 135. The manner in which the examination is conducted must be described in the operator's approved training program.

**4.28.3.15. TWILIGHT AND NIGHT OPERATIONS.** GACA applies the concepts and definitions of twilight and night operations by addressing the definition of night (GACAR § 1.1), the requirement for aircraft lighting (GACAR §§ 91.173 and 91.303), and pilot recency of night experience (GACAR § 61.17).

**4.28.3.17. SERVICING OF AN AIR AMBULANCE AIRPLANE WITH PATIENTS ON BOARD.** Inspectors should consider the following requirements when evaluating an airplane air ambulance operator's procedures for servicing its aircraft when passengers (patients) are on board:

**A. Refueling Procedures.** Airplane air ambulance operators may need to conduct operations that are not normally experienced in conventional operations, such as the refueling of an aircraft with the engine running or with passengers on board. Before conducting such operations, the

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operator must develop procedures acceptable to the GACA and publish these in the operator's Operations manual (OM) (see Volume 4, Chapter 12, Section 4, Evaluate an Operations Manual for Parts 121, 125, 133 and 135). The operator must train and qualify all applicable personnel in these procedures before conducting such operations.

**B. Evacuation Procedures.** An air ambulance operator's refueling and oxygen replenishment policies and procedures should include any special considerations for the evacuation of patients in case of emergencies.

**4.28.3.19. SERVICING OF ROTORCRAFT AIR AMBULANCE AND REMS ROTORCRAFT WITH PATIENTS ON BOARD.** Inspectors should consider the following requirements when evaluating a rotorcraft air ambulance or REMS operator's procedures for servicing rotorcraft when passengers (patients) are on board:

**A. Refueling Procedures.** Rotorcraft air ambulance and REMS operators may need to refuel aircraft with the engine running, rotors turning, or with passengers (patients) on board. Before conducting such operations, the operator must develop procedures acceptable to the GACA and publish these in the operator's OM. The rotorcraft air ambulance or REMS operator must train and qualify all applicable personnel in these procedures before conducting such operations.

1) Only turbine engine rotorcraft fueled with JET A or JET A-1 fuels should be fueled while an engine is running.

2) Rotorcraft being refueled while an engine is running should have all sources of ignition of potential fuel spills located above the fuel inlet port(s) and above the vents or tank openings. Ignition sources should include, but should not be limited to the following:

a) Engines.

b) Exhausts.

c) Auxiliary power units (APU).

d) Combustion-type cabin heater exhausts.

e) Only under the following conditions should operators permit rotorcraft fueling while engines are running:

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1. A company trained and qualified rotorcraft pilot should be at the aircraft controls during the entire fuel servicing process.
2. Patients should be off-loaded to a safe location before rapid refueling operations. Where the pilot in command deems it necessary for patients to remain onboard for safety reasons, all rotorcraft engine(s) should be shut down and the refueling conducted with the engine(s) off.
3. Passengers should not load or off-load during rapid refueling operations.
4. Only designated personnel, properly trained in rapid refueling operations, should operate the equipment. Written procedures should include the safe handling of the fuel and equipment.
5. All doors, windows, and access points allowing entry to the interior of the rotorcraft that are adjacent to, or in the immediate vicinity of, the fuel inlet ports should be closed and should remain closed during refueling operations.
6. Before introducing fuel into the rotorcraft, the rotorcraft should be bonded to the fuel source to eliminate the potential for static electricity.
7. Fuel should be dispensed into an open port from approved dead man-type nozzles, with a flow rate not to exceed 38 liters-per-minute (10 US gallons-per-minute), or through close-coupled pressure fueling ports. Where fuel is dispensed from fixed piping systems, the hose cabinet should not extend into the rotor space. The operator should provide a curb or other approved barrier to restrict the fuel-servicing vehicle from coming closer than within 3 meters (10 feet) of any rotorcraft rotating components. If an operator cannot provide a curb or approved barrier, fuel-servicing vehicles should be kept 6 meters (20 feet) away from any rotorcraft rotating components and a trained person should direct fuel servicing vehicle approach and departure.

**B. Evacuation Procedures.** In case of emergencies, a rotorcraft air ambulance or REMS operator's refueling and oxygen replenishment policies and procedures should include any special considerations for the evacuation of passengers (patients). Inspectors should consider the following requirements when evaluating a rotorcraft air ambulance or REMS operator's

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procedures for evacuation of passengers during rotorcraft servicing:

- 1) If passengers remain onboard an aircraft during fuel or oxygen servicing, at least one qualified person trained in emergency evacuation procedures should be in the aircraft at or near a door at which there is a passenger loading walkway, integral stairs that lead downward, or a passenger loading stair or stand. In the case of any patient(s) remaining on board, there should be enough qualified people trained in emergency evacuation procedures to evacuate the patients.
- 2) A clear area for emergency evacuation of the aircraft should be maintained adjacent to not less than one additional exit.
- 3) If fueling operations take place with passengers onboard away from the terminal building and stairways are not provided, such as during inclement weather (diversions), the operator should notify the Aircraft Rescue and Fire Fighting (ARFF) to assume a stand-by position near the fueling activity with at least one vehicle.
- 4) During rapid refueling, the air ambulance rotorcraft operator should establish specific procedures covering emergency evacuation for each type of aircraft they operate.
- 5) Operators should display all no smoking signs in the cabin(s), and the crew members should enforce the no smoking rule.

**4.28.3.21. POSTFLIGHT PROCEDURES.** The PIC is responsible for ensuring compliance with the air ambulance or REMS operator's decontamination procedures for the protection from, and control of, infectious conditions.

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#### **CHAPTER 28. AIR AMBULANCE AND REMS OPERATIONS**

##### **Section 4. Air Ambulance and REMS Operations Training Programs**

**4.28.4.1. GENERAL.** This section contains guidance to be used by General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspector) when evaluating an operator's training program for flight crew and medical personnel involved in air ambulance or rotorcraft emergency medical service (REMS) operations. This section also contains elements that Inspectors should consider when making such evaluations, as appropriate to the operator's operations (see Volume 4, Chapter 21 for the types of training categories that operators must use in training curricula in general). Operators must still comply with all other GACAR Part 91, 121, 125 or 135 requirements, as applicable, and with other applicable guidance. This section covers the instructional areas for rotorcraft and airplane air ambulance and REMS training programs, and coordination training for medical personnel and flight crews in air ambulance and REMS operations.

**NOTE:** For the purposes of this training, a “response scene” refers to a site where a REMS operation is conducted, which involves non-routine, hazardous situations.

**4.28.4.3. AIR AMBULANCE TRAINING PROGRAMS.** Special consideration should be given to crew resource management (CRM) and crew coordination procedures to ensure that they are an integral part of each air ambulance operation. Inspectors should consider the following elements when evaluating an operator's airplane air ambulance flight training program and airplane air ambulance ground training program:

**A. Air Ambulance Flight Training Program.** There are no aircraft flight training maneuvers that are unique to air ambulance services.

**B. Air Ambulance Ground Training Program.** Inspectors should ensure that the following areas are included in the operator's ground training curriculum:

- Aircraft medical systems variations
- Passenger restraining methods in flight
- Handling problem passengers

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- Flight crew functions and responsibilities
- Prevention and control of infectious conditions (to include knowledge of infectious and communicable diseases, diseases recently identified as occupational health risks such as hepatitis B, herpes simplex, herpes zoster, and AIDS)

### **4.28.4.5. ROTORCRAFT EMERGENCY MEDICAL SERVICES (REMS) TRAINING**

**PROGRAMS.** Inspectors should consider the following elements when evaluating an operator's air ambulance flight training program and air ambulance ground training program:

**A. REMS Flight Training Program.** Crew resource management (CRM) and crew coordination procedures are an integral part of each of the flight maneuvers that follow. Inspectors should ensure that each of these maneuvers is included in the operator's flight training curriculum:

- Unimproved takeoff/landing area operations
- Night cross-country
- Night cockpit lighting considerations
- Night forced landing
- Communications, air to ground and flight crew/medical crew
- Inadvertent instrument meteorological conditions (IMC) (should include demonstrated control of the aircraft in simulated or actual instrument meteorological conditions)
- Techniques used with lighting equipment

**B. REMS Ground Training Program.** Inspectors should ensure that the following areas are included in the operator's ground training curriculum:

- Day-response scene operations
- Night-response scene operations
- Obstacle recognition

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- Use of local area maps
- Aircraft systems variations (such as special electrical generation)
- Passenger restraining methods in flight
- Local flying area orientation (day/night)
- Handling problem passengers
- Adequacy of landing sites
- Flight crew functions and responsibilities
- Foreign operations (if appropriate)
- Prevention and control of infectious conditions (to include knowledge of infectious and communicable diseases and diseases recently identified as occupational health risks, such as hepatitis B, herpes simplex, herpes zoster, and AIDS)

### **4.28.4.7. MEDICAL PERSONNEL AND FLIGHT CREW COORDINATION TRAINING.**

**A. Training in Coordination Procedures.** In air ambulance and REMS operations, the medical personnel and the flight crew are involved in two distinct operations. While flight crew members are generally not required to be trained in any medical subject areas, medical personnel are required to be trained in some flight operational procedures. Additional training for medical personnel is permitted in specific areas that the operator deems necessary. Operators must have training in coordination procedures to be used between flight crew members and medical personnel in specified situations. These specific situations must include, but are not limited to, the following:

- Physiological aspects of flight
- Patient loading and unloading
- Safety in and around the aircraft
- Passenger briefing (when appropriate)

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- Appropriate in-flight emergency procedures
- Emergency landing procedures
- Emergency evacuation procedures

**B. Medical Personnel Considered Crew members.** Medical personnel may or may not be considered crew members at the discretion of the operator. If the operator desires to consider the medical personnel crew members, the medical personnel must complete initial and recurrent crew member training programs appropriate to their crew position. Additionally, the medical personnel must perform some duty in an aircraft that relates to the operation of that aircraft, such as assisting the flight crew in seeing and avoiding other aircraft, evaluating a landing site, coordinating with ground personnel at a landing site, and emergency shutdown of aircraft systems in a crash.

**NOTE:** If the medical personnel are determined to be crew members by the GACA, they are not considered as passengers.

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#### **CHAPTER 28. AIR AMBULANCE AND REMS OPERATIONS**

##### **Section 5. Operations Risk Assessment for Rotorcraft Emergency Medical Services (REMS)**

###### **4.28.5.1. BACKGROUND AND DEFINITIONS.**

**A. Introduction.** This section contains information and material to be used by General Authority of Civil Aviation (GACA) aviation safety inspectors (Inspectors) when performing an operations risk assessment of Rotorcraft Emergency Medical services (REMS). Rotorcraft emergency medical services (REMS) operate in a demanding environment. They provide an invaluable service by providing crucial, safe, and efficient transportation of critically ill and injured patients from accident sites to medical care facilities. While REMS is an important component of the medical infrastructure, from an operational standpoint, it is a commercial aviation activity performed by certificated commercial air operators. It must be conducted with the highest level of safety. To meet this requirement, risks must be identified, assessed, and managed to ensure that they are mitigated, deferred, or accepted according to the operator's ability to do so within the regulations and standards appropriate to the operation.

###### **B. Regulatory Requirements.**

1) GACAR Part 121 and 135 require operators to have management personnel who exercise control over operations to possess certain specified experience and other requirements.

Persons in these positions are required to discharge their duties to meet applicable legal requirements and to maintain safe operations.

2) REMS operators must have adequate management personnel in place. These personnel, within the extent of their responsibilities, must have a full understanding of safe aviation operating practices as they relate to the medical purposes of their REMS operations. They must discharge their duties to meet applicable legal requirements and to maintain safe operations throughout their organization and locations. The use of a risk assessment and risk management program provides a way to ensure that these management responsibilities are met.

###### **C. Historical REMS Accident Data.**

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- 1) A review of REMS accidents reveals that controlled flight into terrain (CFIT), inadvertent flight into instrument meteorological conditions (IMC), and lack of operational control are the predominant causal factors, particularly at night and during low visibility conditions. A significant number of REMS accidents occurred during night operations. 75% of the night accidents occurred during operations that originated under visual flight rules (VFR) where the pilots inadvertently flew into IMC conditions resulting in a CFIT accident.
- 2) This review also revealed that inadequate risk assessment and numerous management deficiencies might have contributed to many fatal accidents in REMS operations. Inspectors must ensure that REMS operators emphasize a safety culture within their organization by applying basic Safety Management System (SMS) safety principles and risk management techniques to their operations (see Volume 2). REMS air operators should also be advised to apply safety principles or risk assessment/management strategies to each flight.

**D. Basic Concepts Used in a System Safety Risk Management/Assessment Program.** System safety risk management techniques optimize safety by identifying operational hazards and related risk, and eliminating or mitigating them to a safe state by using established policies and procedures. The operator's procedures manual should contain clearly defined procedures for maintaining operational control during all phases of aircraft operations, and those procedures should contain processes or procedures for risk assessment and management. The pilot has the ultimate responsibility and authority to determine the risks associated with a flight operation. However, the method of operational control should promote the pilot's use of all available resources, to include the input of mechanics, communications specialists (individuals who function as a dispatcher/flight follower), both ground and flight medical personnel, managers, and all other related support personnel involved with a flight operation.

- 1) *Concepts.* The basic concepts of risk management include:
  - a) The overriding concept is that the pilot's authority to decline a flight assignment is supreme, while his decision to accept a flight assignment is subject to review, if certain risks are identified.
    1. The pilot's decision to decline, cancel, divert, or terminate a flight overrides any decision of other parties to accept or continue a flight.
    2. The pilot's decision to accept a flight assignment may be overridden by other personnel by use of the operational control procedures and policies of the

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certificate holder, including the use of risk assessment and management tools and techniques.

- b) If the pilot has declined a flight assignment, no other parties (management, operations, etc.) must continue to conduct risk assessments pertaining to that flight, as their input could not be used to override the pilot's decision to decline the assignment.
- c) A risk-assessment plan is a tool used by the flight management personnel and flight crews to expand the parameters of decision-making for the pilot and flight crew, and to assist in preflight planning and operational control of the aircraft. The company should have procedures on how to mitigate or reduce the risk to an acceptable level.
- d) If the pilot's initial risk assessment results in a tentative decision to accept the flight, but significant risks have been identified, then per the company's integrated risk assessment plan, additional operational inputs are used.
- e) As potential hazards are identified in the assessment process, collaborative groups of additional persons who have the experience/knowledge to assist the flight crew in safety determinations are brought into the decision-making process. Such collaboration should never result in the questioning or overruling of the pilot's determination that the risks associated with a flight mission or operation are too numerous or high.

2) *Examples.* Examples of risk assessment and risk management could include:

- a) The flight crew is aware of a maintenance discrepancy that has been repaired, or a component that has been overhauled. The flight crew may be concerned with what to watch for on subsequent flights, i.e., higher temperatures or higher pressures (providing the instrument readings are within the required operating range), and seek input from maintenance professionals.
- b) A VFR-only pilot accepts a flight assignment in marginal VFR conditions, and following the company's risk management plan receives subsequent input on the status of nearby aerodromes/heliports. The pilot then uses the information to support his decision: to fly the planned flight, cancel the flight, delay the flight until weather improves, or determines that an instrument flight rules (IFR) certificated aircraft and flight crew is required. In any case, the information is used to support the pilot's

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decision making process.

3) *Variables*. In the above examples, as more information is acquired to assist the flight crew with the go/no-go decision-making process, another iteration or cycle in the risk assessment process is begun and the determination to fly is reviewed against a new, better-defined, standard/environment. Typical risk variables include, but are not limited to:

a) Weather (Current and Forecast).

- Ceiling, visibilities-departure, en route, arrival, alternate
- Precipitation-type(s)
- Turbulence-existing and forecast
- Icing-type and forecast
- Winds/gust spread-wind direction, speed, gust spread
- Density altitude
- Ambient lighting

b) Airworthiness Status of the Rotorcraft.

- Proper preflight
- Any deferred items in accordance with the minimum equipment list (MEL)
- Fuel and oil serviced
- Security of cowling(s), doors and/or equipment
- VFR vs. IFR equipment capabilities
- Inspection status
- Recent maintenance actions

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- Time remaining until next inspection, overhaul, teardown, etc.
- Required current maps, approach plates, Notices to Airmen (NOTAMs.)

c) Incorporation of Technologies to Aid in Managing Risks.

- Radio/radar altimeters
- High intensity search/landing light systems
- Moving map display systems
- Airborne weather radar systems
- Night vision imaging systems (NVIS)
- Enhanced vision systems (EVS)
- Autopilot/stability augmentation systems
- Terrain Awareness and Warning System (TAWS)
- Adequacy of training on new technologies

d) Performance Margins.

- Mass and balance margins
- High density altitudes
- Fuel margins and range limitations
- Pilot and flight crew member performance
- Experience in make and model of rotorcraft, area of operations, and type of operation
- Rest, duty, and flight time impacts on human performance (additional duties)

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during duty time and adequate sleep during rest period time)

- Personal performance factors, such as personal stress (recent divorce, death, illness, or birth in family)
- Influence of pilot's knowledge of the patient's status (pediatric, critical injury)
- Communication between crew and all pertinent specialists
- Continuity during shift changes
- Currency of training
- Inadvertent IMC training
- Crew resource management
- Experience of crew members operating together as a unit

### e) Operating Environment.

- Terrain/obstructions
- Ambient lighting
- Natural and industrial weather factors
- Availability and status of aerodromes/heliports
- Air traffic density
- Knowledge that other operators in the area have declined the flight due to:
  - o Localized weather
  - o Forecast weather
  - o Recent flight(s) experiencing marginal conditions

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- Airspace requirements
  - Communications and navigation facilities
  - Availability of low-level VFR route structure
- f) Organizational Environment.
- Changes in required management personnel
  - Changes in air operator management
  - Rapid expansion or growth
  - New or major program changes
  - Organization accidents, incidents, or occurrences

**4.28.5.3. RISK ASSESSMENT PROGRAM CONFIGURATIONS.** Each REMS operator must develop its own risk assessment tools. The REMS operational community has many risk assessment tools and programs available through shared resources. There is no “one size fits all” tool. Each operator should consider its own operational and environmental needs in developing its risk assessment tool(s) and plans. In addition, these unique operational and environmental needs will drive the relative weight of each identified risk for each operation and/or location. The operator must determine the specific weighting of risks for its particular operation. The examples given are for reference only; the GACA does not endorse the use of one tool over another. Each of the following risk assessment configurations is useful; however, an integrated program providing enhanced training in aeronautical decision-making, combining procedure-weighted, training-weighted, and other programs, may achieve the best results.

**A. Procedure-Weighted Program.** To standardize risk assessment while minimizing training requirements, an operator may opt to develop and implement a “procedure-weighted” program configuration. This configuration typically uses a checklist format tool, often with numerical weighting values, which trigger levels of concurrence with the pilot’s “go” decision.

- 1) Advantages of the Procedure-Weighted Configuration Include:

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- a) Minimal training is required on the principles of risk assessment and risk management.
  - b) Standardized assessment of risks and mitigations, especially when using a system that is numerically based.
- 2) Disadvantages of the Procedure-Weighted Configuration Include:
- a) Takes more time and effort to complete the assessment, and may delay departure.
  - b) May not provide visual cues to the level of risk and, therefore, may not be as obvious to all users.
  - c) A checklist may not address the continuing risk assessment skills necessary during the entire flight. Risk assessment is an ongoing process; during a single flight, multiple risks are monitored on different levels.

**B. Training-Weighted Program.** To minimize the time spent upon receiving a flight assignment, an operator may opt to “front load” its efforts in risk assessment and risk management by providing a higher level of training on the principles of risk assessment and developing a highly integrated risk management program. In doing so, it may be able to achieve an effective risk assessment and risk management program by using simple (and often graphically based) decision tools.

- 1) Advantages of the Training-Weighted Configuration:
- a) In practical use, minimal time is required to make the series of decisions necessary to assess and manage risks.
  - b) The use of graphical tools provides a visual, immediately understood description of the risk and the required mitigations.
- 2) Disadvantages of the Training-Weighted Configuration:
- a) May require more demanding training at the initiation of the process and in subsequent recurrent training.

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b) May require a stronger set of “soft skills” by users of the process.

**NOTE:** Soft skills refers to proficiencies that go beyond technical knowledge and psychomotor skills necessary to operate a rotorcraft and are often the first line of defense-and sometimes the last-against accidents caused by lapses in human performance. This includes adherence to standard operating procedures, decision-making, judgment, Air Medical Resource Management (AMRM) (similar to crew resource management), and professionalism. These skills are not easily or quickly conveyed in training programs; but are developed through the continuing commitment of corporate owners/executives, managers, trainers, pilots, crew members, mechanics, medical staff, and communication specialists to an organizational safety culture.

**C. Alternative Risk Intervention Policy.** Some operators integrate “releasing authority” after a non-routine event. Experience has shown that the REMS community tends to hire “mission oriented” individuals who will seek ways around an obstacle to complete the mission. It may be beneficial to intentionally slow the go/no-go decision-making process, particularly at the first indication that an abnormal situation might be developing.

**4.28.5.5. INSPECTOR RESPONSIBILITIES.** Inspectors assigned to REMS operators, should review risk management guidance, and ensure operators implement an SMS-based risk assessment and management program. This may incorporate the information found in this guidance as a component of the program or otherwise identify their management processes and operational controls. These controls greatly enhance safe operating practices when applied in flight operations and better maintain safe operations. Inspector’s should discourage the use of the term “mission” to describe flight assignments in operator manuals, training, and risk assessment programs. The emphasis should be on providing safe air transportation rather than completing a “mission,” which has been derived from military tactical or combat aviation that factors in “acceptable losses,” and may affect the normal go/no-go decision making process of an air transportation perspective.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 29. PART 147 ADMINISTRATION**

##### **Section 1. Evaluate and Approve Curriculum and Instructor Qualifications for Part 147**

###### **4.29.1.1. GACA ACTIVITY REPORT (GAR).**

A. 3384 (AW) (Initial)

B. 3385 (AW) (Revision)

**4.29.1.3. OBJECTIVE.** This chapter provides guidance for evaluating the curriculum or curriculum revisions and instructor qualifications of an Aviation Maintenance Technician School (AMTS) certificated under General Authority of Civil Aviation Regulation (GACAR) Part 147.

###### **4.29.1.5. GENERAL.**

**A. Definitions.** All definitions and terms utilized in conjunction with an AMTS are located in GACAR Part 1 and the Appendices to GACAR Part 147.

**B. Curriculum Background.** GACAR § 147.31 sets forth the minimum general curriculum requirements. The maintenance of curriculum requirements is set forth in GACAR § 147.33.

1) Practical projects referred to in GACAR § 147.31(d) include all functions specified in the curriculum that involve hands-on tasks. Therefore, practical projects should include virtually any task taught to level 2 or 3, as specified in Part 147 appendices, since all of these require some practical application.

2) GACAR § 147.33 addresses the maintenance of curriculum requirements. Generally, GACAR Part 147 prescribes minimum standards for certification and operation. Curriculum subjects may be taught at levels exceeding those shown in the Appendix A, but only by approval of the President.

3) An AMTS must adhere to its approved curriculum. Any new course material the school wishes to add must be incorporated into the approved curriculum and approved by the General Authority of Civil Aviation (GACA) before it may be used. This does not prohibit a

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school from teaching other non-GACA-approved courses, such as refresher courses or academic courses required to complete a degree program. However, those courses must be clearly distinguishable and separate from approved AMTS courses. In addition, other courses offered must not detract from the quality of instruction or any part of GACAR Part 147 that would otherwise be offered and must be described in detail in the curriculum and/or the school's operating rules.

4) Aviation safety inspectors (Inspectors) should inform the school of its responsibility to keep its approved AMTS curriculum current with industry needs by revising courses. The Inspector must make it clear that these revisions require GACA approval before the school can implement them.

**C. Curriculum Components.** The GACA must approve the curriculum or revision. The GACAR Part 147 curriculum will consist of the following for each subject:

- Subjects taught
- Course content
- Teaching level requirements
- Test requirements
- Classroom or theory hours
- The total number of hours required for successful completion
- Shop or lab hours
- A schedule of required tests or quizzes
- Order of instruction for each subject
- Interruptions in the order of instruction

**NOTE:** Each certificated AMTS must include how it intends to comply with GACAR Part 147, Subpart B, in its Training and Procedures Manual (see GACAR § 147.7).

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**D. Texts.** If specific texts or technical manuals receive approval as part of the curriculum, any change to a different text or manual will require GACA approval as a revision.

### **4.29.2.7. CURRICULUM REQUIREMENTS.**

**A. Hours of Instruction.** The number of hours of instruction offered must be at least the minimum specified by GACAR § 147.31. The school may offer more hours of instruction; however, regardless of the number of hours offered, the GACA must approve the entire Aviation Maintenance Technician (AMT) curriculum at the time of initial certification. Do not include the following blocks of time in calculating the minimum number of instructional hours specified in GACAR § 147.31:

- Time used to take the oral and practical test
- Time spent in taking the knowledge test
- Time set aside for review and final testing at the conclusion of the course. This is not to preclude review and testing from the curriculum, but to differentiate between the time spent in learning new material and the time spent in review

**B. Order of Instruction.** The curriculum must describe the order of course progression for each rating offered. The order must be described in the curriculum to provide a logical order of instruction. For example, basic electricity would be followed by aircraft electrical systems. The order of instruction must be identified and evaluated by the GACA during the curriculum approval process to ensure satisfactory quality of instruction. Allowances to deviate from the order of instruction may be permissible on a case-by-case basis (inoperative mock-ups, hospitalized instructor, etc.) in accordance with procedures described in the curriculum and/or the school's operating rules. Continuous deviations will necessitate a revision and subsequent GACA approval.

**C. Interruption in the Order of Instruction.** The GACA does not consider interruptions a change in the order of instruction. As with other technical and college type programs, interruptions from course curriculum may occur for a variety of reasons (sick, financial problems, summer vacation, etc.). An interruption for the purpose of attending a non-GACA-approved course is viewed no differently than those previously mentioned. However, all interruptions (scheduled or unscheduled) to the approved curriculum must be described in the curriculum and/or the school's operating rules and approved by the GACA. The assigned principal

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inspectors (PI) will monitor all interruptions in the order of instruction to ensure that these interruptions do not detract from the quality of instruction. Continuous deviations may require a revision.

**D. Subjects Prescribed by Part 147.** The curriculum must cover the subjects and items prescribed in GACAR Part 147, Appendices B, C, D or E as applicable.

- 1) Subjects submitted for approval as part of the curriculum do not become part of the curriculum until the GACA approves them.
- 2) Each subject item must be taught at the minimum level of proficiency as defined in Part 147, Appendix A. When the school wishes to teach a subject item to a level beyond the requirements, the teaching level must be made part of the approved curriculum. Subject items must not be taught to a level less than that shown in the approved curriculum.
- 3) Additional subjects/courses that are required by the school for their purposes (i.e., degree programs), must not be submitted as part of the GACA-approved curriculum.
- 4) There must be a distinction made between additional courses/subjects that are part of the approved curriculum under GACAR Part 147 and those that are not.
- 5) The teaching of additional subject material beyond the requirements of Part 147, Appendixes B, C, D and E will require additional instruction hours beyond those required by GACAR § 147.31.

### **E. Practical Application Projects.**

- 1) The curriculum must list the practical projects that must be completed for each subject item. There must be sufficient practical projects to address the requirements of GACAR Part 147, Appendices B, C, D and E, as applicable. The curriculum must include enough detail to evaluate the practical projects for correct teaching level, for equipment and tools needed, and for performance standards and objective grading criteria.
- 2) The teaching level must be specified for each project under each subject item. The GACAR Part 147 appendices specify the minimum teaching level. As in the case of theoretical courses, if the teaching level is to exceed the GACAR requirements, it must be specified as such in the curriculum.

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3) The curriculum must show an appropriate amount of time for each project. Inspectors must look for time allotments that are excessive or insufficient.

4) The curriculum must provide that each task in each subject item is accomplished. For example, if a project requires that the student inspect and repair to accomplish a practical project, the project plan must include a requirement for both inspection and repair.

5) The overall curriculum must be taught at least 50 percent in the shop or lab. However, not every subject item lends itself to 50 percent shop work. The Inspector should ensure that shop and theory are balanced as appropriate to the subject item being taught. The Inspector should review the curriculum if the courses seem artificially organized to meet the 50 percent requirement.

**F. Scheduling of Tests.** Upon completion of each curriculum subject, a test must be scheduled. In addition, quizzes may be scheduled between subject items.

**G. Grading Criteria.** A generally accepted academic standard for passing (including the GACA written exams) is a minimum of 70 percent. However, the school may require a higher minimum passing grade. Students must pass all theoretical and practical portions of each subject listed in the curriculum to the approved grading standard. Students must pass each practical project as well to the approved standard.

### **H. Make-up Provisions.**

1) The curriculum must show the number of hours of allowed absences.

2) All material missed must be made up in the same subject area.

3) Students must make up all practical projects missed.

**4.29.1.9. REVISIONS TO THE CURRICULUM.** Changes to the approved curriculum must receive approval before implementation. Changes in the curriculum may include changes in any of the following:

- Teaching level
  - Hours of instruction
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- Testing
- Make-up provisions
- Course content
- Equipment or facilities affecting instruction in theoretical subjects or the accomplishment of practical projects
- Order of instruction
- Interruptions in the order of instruction
- Addition or deletion of a rating

### **4.29.1.11. CREDIT FOR PREVIOUS INSTRUCTION OR EXPERIENCE.**

**A. Crediting Previous Instruction.** Per GACAR § 147.81(c), the school must use either a reliable method of evaluating documentation or an entrance test to ensure that previous instruction is comparable to that offered by the crediting school. When not using an entrance test, schools should be encouraged to use catalogs, course descriptions, and other documents to determine the credit to be granted.

- 1) *Students May Take a Course of Study for One Rating.* The course of study will include the general portion of the curriculum. A student returning to school to study for a second rating after having graduated from the course for the first rating will not have to retake the general portion of the curriculum. The general portion undoubtedly must be separate and distinct from the Airframe, Powerplant or Avionics portions and conform to the requirements of GACAR Part 147, Appendices A and B.
- 2) If a certificated AMTS is under suspension by the GACA, courses taught during the suspension period must not be credited retroactively, even if the school becomes re-certificated later.
- 3) An applicant must not teach students as an AMTS before school certification and then give credit for that training after the school becomes certificated.

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4) A school may credit a student with instruction that was completed satisfactorily at another AMTS either before or after its certification (GACAR § 147.81(c)(1)(iv)).

**B. Crediting Previous Instruction from Non-AMTS, Accredited, and Non-Accredited Schools.** As a general practice, credit may be granted only for subjects that apply to the general portion of the curriculum.

**C. Crediting Previous Instruction from Armed Forces School.** When credit is granted, it may be granted only on the basis of an entrance test, as specified in GACAR § 147.81(c)(2)(iii).

**D. Credit for Previous Experience.** As a general rule, creditable previous mechanic experience will be aviation maintenance experience. Credit for all previous experience must be documented and demonstrated by testing. The test must be equal to the test given to students who complete the comparable required curriculum subjects at the school.

### 4.29.1.13. INSTRUCTOR QUALIFICATIONS AND FACULTY REQUIREMENTS.

**A. Faculty Requirements.**

- 1) An instructor must hold a mechanic certificate issued under GACAR Part 66 (or equivalent foreign certificates issued by other ICAO Contracting States that are acceptable to the President) with ratings appropriate to the subjects that the instructor teaches.
- 2) Individuals listed as instructors, lab assistants or teaching assistants also must be certificated properly if they are used for instruction in any subjects other than mathematics, physics, drawing, or similar subjects. Evaluate the suitability of non-certificated instructors to teach certain general courses on an individual basis. Cases have arisen where instructors have not taught these subjects in a manner applicable to aviation maintenance. Inspectors must be aware of this type of situation and ensure that instructors teach the appropriate information according to the GACA-approved curriculum.

**B. Student/Teacher Ratios.** GACAR § 147.63 requires at least one certificated instructor for each 25 students in each shop class.

**C. Performance.** The Inspector should encourage the school to provide for regular assessment of instructor performance.

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### 4.29.1.15. PROCEDURES.

**A. Review the Curriculum.** For an initial certification, thoroughly analyze the curriculum before the date of the team inspection. Ensure the following:

- Describes policy and procedures-operating rules
- The number of hours meets the requirements of GACAR § 147.31
- The curriculum fulfills the requirements of GACAR Part 147 appendices A, B, C, D and E
- Instructor qualifications match the subjects being taught
- All subjects taught to level 2 or 3 involve practical hands-on projects
- Recommend at least 50 percent of the total curriculum is spent in the lab and/or shop as defined by GACAR Part 147, Appendix A, level 2 and level 3 requirements
- The curriculum shows a schedule of tests for each subject
- The curriculum states the minimum standards for a student to successfully complete the requirements for certification under GACAR Part 66
- Grading criteria for academic and practical subjects have been developed
- Include make-up provisions
- There are developed procedures for crediting previous experience or instruction
- Order of instruction
- Interruptions in the order of instruction

**B. Review Instructor Qualifications.** Ensure that the instructors' certificates are valid and that there are no certificate actions pending.

### 4.29.1.17. TASK OUTCOMES.

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### **A. Complete the GACA Activity Report (GAR).**

### **B. Complete the Task.** Completion of this task will result in the following:

- 1) If curriculum/revision/instructor qualifications are approved.
  - As appropriate to the approved method for recording revisions, initial the applicable document(s). Return the curriculum to the school.
  - Issue/Amend Operation Specifications (OpSpecs) – see Volume 15, Chapter 10 for further details.
- 2) If curriculum/revision/instructor qualifications are not approved.
  - Send a letter to the school outlining the deficiencies and explaining why the curriculum is unacceptable and requires revision. In all cases, reference the applicable GACAR parts.
- 3) If an instructor is found to be unqualified or otherwise ineligible to teach the subjects as designated by the school curriculum, notify the school in writing, detailing the specific problem.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY – ADMINISTRATION**

#### **CHAPTER 29. PART 147 ADMINISTRATION**

##### **Section 2. Evaluate Facilities, Equipment, Materials, Tools and Records for Part 147**

###### **4.29.2.1. GACA ACTIVITY REPORT (GAR).**

A. 3230 (AW)

**4.29.2.3. OBJECTIVE.** This section provides guidance for evaluating the facilities, equipment, materials, and tools for an Aviation Maintenance Technician School (AMTS). The evaluation occurs as part of an original certification, addition of a rating, curriculum change, or change of location.

**4.29.2.5. GENERAL.** An AMTS must have instructional equipment and suitable facilities appropriate to the ratings taught and approved by the General Authority of Civil Aviation (GACA). Materials and tools must be of a type, quantity, and quality appropriate to the needs of the curriculum and the number of students.

**4.29.2.7. DEMONSTRATION ACTIVITY.** Ensure compliance with regulations as follows:

- That facilities meet the requirements of General Authority of Civil Aviation Regulation (GACAR) §§ 147.41 and 147.43
- That instructional aids meet the requirements of GACAR § 147.45
- That materials, tools, and shop equipment meet the requirements of GACAR § 147.47

**4.29.2.9. FACILITIES.** The instructional equipment, shop equipment, hand tools, and physical layout of the building must meet the requirements outlined in GACAR §§ 147.41, 147.43, and 147.45. The Inspector should keep in mind that the facility must constitute an environment suitable for learning.

**A. Classroom Areas.** An area suitable for classroom instruction may not be suitable for lab and/or shop. With appropriate scheduling and consideration of factors such as ventilation, lighting, noise, and temperature control, an area appropriate for lab and/or shop may be acceptable for classroom instruction.

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**B. Shop Environment.** Ventilation must be such that it properly removes fumes from painting, fueling, degreasing, doping facilities, etc., from the immediate work area and does not allow them to pass into other instructional areas.

### C. Facility Size and Location.

- 1) Facilities must be adequate to hold the number of authorized students participating in any of the shop/lab projects designated for that area.
- 2) Facility locations and class schedules must be so that students can travel between classes without cutting into instructional time.

### 4.29.2.11. EQUIPMENT.

#### A. Instructional Equipment.

- 1) The instructional aids required in GACAR § 147.45 must be appropriate to the scope and depth of the curriculum of the school. The Inspector must determine whether the complexity of instructional aids is appropriate to the specific teaching level of the subject item.
- 2) In some situations, the school may choose to use active aircraft for instructional purposes in the shop. This is permissible as long as the aircraft is on the premises at the time of instruction. The Inspector must remind the school that active aircraft used to comply with GACAR §§ 147.45(a)(2) and (d) must become part of the approved instructional equipment and must be available as specified in GACAR § 147.85.
- 3) The aviation safety inspector (Inspector) must ensure compliance with requirements for the ratio of instructional equipment to students in each shop course. GACAR § 147.45(c) requires that a maximum of eight students may work at any one unit of equipment at a time. However, the Inspector may determine whether or not eight students are too many to complete a certain project safely and competently, such as when using live aircraft for the demonstration of gear retraction systems.

#### B. Shop Equipment.

- 1) The Inspector must determine if enough equipment is in place and in satisfactory operating condition to serve the student enrollment adequately and meet shop project

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requirements.

2) The location of equipment must be so that its operation can be in a safe and efficient manner. The installation of large standing equipment must be secure. The placement of large pieces of equipment should provide sufficient aisle space so that the students can move about freely. The Inspector must determine if the floor is free from clutter and items such as extension cords.

**4.29.2.13. MATERIALS.** The school must have sufficient materials in stock and properly stored to provide for the approved student enrollment. To ensure adequate instruction, the amount and variety of stock should directly reflect the requirements of the curriculum.

### **4.29.2.15. TOOLS.**

**A. Tool Standards.** For subjects taught at level 3, all tools required to meet “return to service” standards must be in satisfactory working condition and of the proper kind for their intended purpose. GACAR § 147.47 requires the school to have an adequate supply of materials and tools appropriate to the curriculum of the school.

**B. Student Hand Tool Policy.** The school may either provide common hand tools or require students to furnish their own. In either case, the school must establish a policy on provision of common hand tools. The curriculum must list any tools that the school requires the student to furnish. The school will furnish special tools, such as cylinder hold-down wrenches, micrometers, etc.

### **4.29.2.17. CHANGES TO THE CERTIFICATE.**

**A. Added Rating/Curriculum/Location Change.** When adding a rating or executing a change in curriculum or location that affects facilities, equipment, materials, or tools, etc., the AMTS must request in advance any change to its rating or curriculum.

- 1) To add a rating, refer to the appropriate sections on changes to curriculum in Section 1, paragraph 4.29.1.9 of this chapter; and the appropriate General Authority of Civil Aviation Regulation (GACAR) sections on changes to equipment, materials, tools, and records.
  - 2) For changes to curriculum, see curriculum requirements as found in Section 1, paragraph 4.29.1.7 of this chapter.
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- 3) For a change in location the AMTS must have the change approved by GACA in advance. The President must be notified, in writing, at least 30 working days before the date the change is contemplated. If the location is changed without approval, the certificate is revoked.
- 4) For all added rating/curriculum/location changes, the AMTS must receive approval from GACA in writing.

**B. Amendment to or Transfer of Certificate.** The AMTS must apply for a change to its certificate if changing the location of the AMTS. The AMTS must notify the GACA in writing at least 30 days before the date of the change. The GACA may prescribe conditions the AMTS must follow while moving to the new address/location. If the AMTS accomplishes the change in location without approval, the AMT school certificate will be revoked. (Refer to GACAR § 147.89.)

- 1) *Sale or Transfer of Assets.* The privileges of a Part 147 AMT school certificate are not transferable. If the holder of the AMT school certificate sells or transfers its assets, the new owner must apply for an amended certificate via the Application for Aviation Maintenance Technician School Certificate and Rating.

### 4.29.2.19. PROCEDURES.

**A. Review the Applicant's File.** Before inspecting the facility, review the applicant's application and GACA office file. Check for any previous violation history. Review previous correspondence. Check the curriculum or proposed curriculum for currency. Take a copy of the curriculum and facility layout to the school site.

**B. Inspect the Facility.** Compare the curriculum against the instructional aids, shop equipment, and hand tools at the site. Compare the physical layout with the facility layout plan.

- 1) Check the instructional aids for agreement with the curriculum. Determine if the items required for each course are actually at the site as required by the approved student level.
- 2) Determine whether all instructional aides are actually operable and safe to use. For example, a retractable landing gear instruction device should operate properly.
- 3) Ensure that adequate stocks of operational/maintenance instructions, parts manuals, and

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technical data are at the site, according to the requirements of the curriculum.

- 4) Determine if the number and size of classrooms and shop areas are consistent with the facility layout submitted with the curriculum. Ensure that the lighting and ventilation are adequate.
- 5) Verify that the tools, materials, and shop equipment match the inventories/descriptions required by the curriculum. Ensure the proper storage of these items.
- 6) Verify that a recordkeeping system is in place for tool inventory, calibration, and the updating of technical instructional materials.
- 7) Inform the applicant of any discrepancies noted. Make a record of such deficiencies in the remarks section of GACA S&ER Form 8310-6, as appropriate.

### **4.29.2.21. TASK OUTCOMES.**

**A. Complete the GACA Activity Report (GAR).**

**B. Complete the Task.** Completion of the task will result in approval or disapproval of a facility.

**C. Document the Task.**

*1) Facility Approved.*

- a) For an added rating, complete the Application for Aviation Maintenance Technician School Certificate and Rating, as applicable. Attach the appropriate documents, as required. Make a copy of the form and all pertinent documents and retain a copy for the office file.
- b) For a curriculum or location change that affects facilities, equipment, or tools, complete the Application for Aviation Maintenance Technician School Certificate and Rating, as applicable. Retain a copy of the form for the office file.

*2) Facility Disapproved.*

- a) Disapproved the Application for Aviation Maintenance Technician School

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Certificate and Rating and return the form to the applicant with attachments. Retain a copy for the office file.

- b) Write a letter to the applicant stating the reasons for disapproval. Advise the applicant to resubmit a new application when the discrepancies are corrected. Upon receipt of a new application, reschedule the facility inspection.

**4.29.2.23. FUTURE ACTIVITIES.** Conduct routine surveillance.

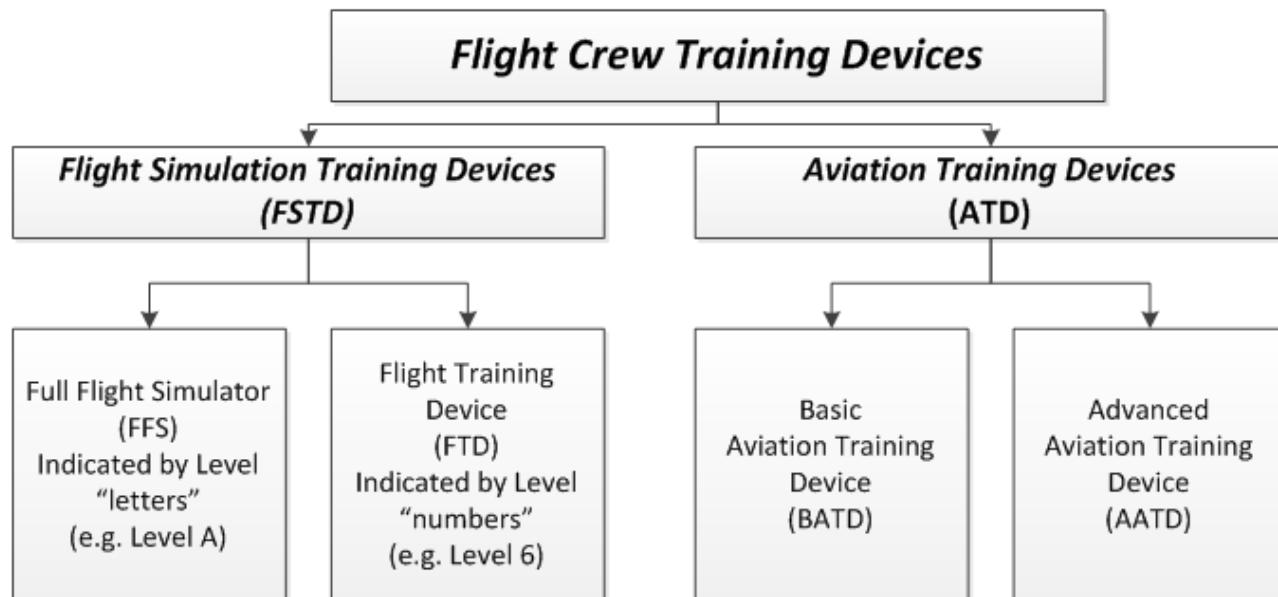
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### CHAPTER 30. FLIGHT CREW TRAINING DEVICES

#### Section 1. Introduction to Flight Crew Training Devices

**4.30.1.1. OVERVIEW.** The General Authority of Civil Aviation (GACA) is responsible for approval of all flight crew training devices used in flight training under the General Authority of Civil Aviation Regulations (GACARs). Flight crew training devices are approved by GACA under GACAR Part 60 and their use in specific training programs is approved under other GACAR parts related to flight training (e.g. GACAR Part 141, 142, etc.). Figure 4.30.1.1 provides a high-level overview of the different kinds of flight crew training devices addressed in this chapter.

Figure 4.30.1.1. Flight Crew Training Devices



**A. Full Flight Simulator (FFS).** This is a replica of a specific type; or make, model, and series aircraft cockpit. It includes the assemblage of equipment and computer programs necessary to represent aircraft operations in ground and flight conditions, a visual system providing an out-of-the-cockpit view, a system that provides cues at least equivalent to those of a three-degree-of-freedom motion system, and has the full range of capabilities of the systems installed in

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the device as described in the qualification performance standards (QPS) for a specific FFS qualification level.

**B. Flight Training Device (FTD).** A replica of aircraft instruments, equipment, panels, and controls in an open or enclosed flight deck area. It includes the equipment and computer programs necessary to represent aircraft operations (or a set of aircraft operations) in ground and flight conditions. It has the full range of capabilities of the systems installed in the device as described in the qualification performance standard (QPS) for a specific FTD qualification level.

**C. Aviation Training Device (ATD).** A device that incorporates representations of aircraft instruments and controls to simulate instrument flight operations.

**D. Basic Aviation Training Device (BATD).** An ATD that provides a training platform for at least the procedural aspects of flight relating to an integrated ground and flight instrument training curriculum.

**E. Advanced Aviation Training Device (AATD).** An ATD that provides a training platform for both procedural and operational performance tasks related to ground and flight training towards private pilot, commercial pilot, and airline transport pilot certificates, a flight instructor certificate, and instrument rating.

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### VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION

#### CHAPTER 30. FLIGHT CREW TRAINING DEVICES

##### Section 2. Approval of an Aviation Training Device (ATD)

###### **4.30.2.1. GACA ACTIVITY REPORT (GAR).**

A. (TBD)

**4.30.2.3. OBJECTIVE.** This section provides criteria and guidance for the approval of an aviation training device (ATD) under General Authority of Civil Aviation Regulation (GACAR) Part 60.

**4.30.2.5. OVERVIEW.** The General Authority of Civil Aviation (GACA) is responsible for approval of ATDs as well as their authorized use. ATDs that are approved under GACAR Part 60 and may be approved for use in pilot training, obtaining flight experience, or maintaining currency requirements for pilot certification or qualification under the GACAR.

**4.30.2.7. ATD USE REQUIREMENTS.** Before a person may qualify an ATD for use in a pilot training program or be able to use the ATD to obtain flight experience or maintain currency, the manufacturer of the device must hold a letter of approval from the General Authority of Civil Aviation (GACA). The letter described in GACAR § 60.67 also allows for an equivalent approval document issued by a contracting State to the Convention on International Civil Aviation with respect to that ATD model and configuration. When the ATD is qualified under the equivalent provision the person seeking to use the ATD must also receive approval from the GACA.

**4.30.2.9. ATD AUTHORIZED USES.** ATDs may be authorized for use for certain flight training activities, currency and experience requirements in accordance with the GACAR. For comparison purposes, an ATD approved in accordance with the provisions of GACAR Part 60, Subpart C may have the same authorized use as a Level 3 Flight Training Device (FTD) approved under the same part.

**A. Pilot Training.** For pilot training, the principal inspector (PI) must approve how the ATD is to be used in the approved training curriculum. This approval also includes the physical training environment and the approval for each ATD being used.

**B. Prohibition of Aircraft Type Specific Training.** An ATD may not be authorized for aircraft type specific training. However, this should not to be confused with procedural/partial task type

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of training where an ATD may be used for such. For example, an ATD may be used to train certain procedural/partial tasks that are not aircraft type specific, instead of training those tasks in an aircraft type specific Level D full flight simulator (FFS). This supplemental use of an ATD should provide for a more efficient and effective use of both the ATD and FFS.

### **4.30.2.11. ATD APPROVAL PROCESS.**

**A. Evaluation Process.** The approval process is initiated when the device manufacturer submits a request for an evaluation of an ATD. The approval of the ATD is based upon the authorization for uses described in paragraph 4.30.2.7 above and is started when a person makes a request to use an ATD for pilot training, or to obtain flight experience or maintain currency using the device. All technical evaluations of ATDs, both Basic Aviation Training Devices (BATD) and Advanced Aviation Training Devices (AATD) shall be made using the applicable Qualification and Approval Guide (QAG). The QAG is an outline of the design criteria for a BATD or AATD.

**B. Design Criteria.** The design criteria for a BATD are described in Appendix 2, paragraph 8 of Federal Aviation Administration (FAA) Advisory Circular (AC) 61-136, (as amended). The design criteria for an AATD are described in Appendix 3, paragraph 3 of FAA AC 61-136 (as amended). A manufacturer or operator who modifies an ATD in any manner must submit a revised QAG to the GACA. This requirement ensures that the desired standards of the originally approved ATD are maintained, including model identification, design, system integrity, aerodynamic modeling, and other essential characteristics of the hardware/software components. The requirement to submit a revised QAG does not preclude minor changes determined by the GACA to have minimal effect on the functional capability of the ATD. Further, it does not preclude changes limited to specific hardware/software “mix and match” elements clearly identified in an approved revision to a QAG for the specific device developed by the manufacturer and intended for sale to the public as an optional ATD model configuration. However, submitting a revised QAG will ensure that exceptions to the more desirable design standards in ATD configurations are minimized. It will also ensure that one-of-a-kind approvals are not issued to individual owners/operators for ATDs that were not intended for sale to the public unless found acceptable to the GACA.

### **C. ATD Approval Process Steps.**

- 1) The requester must send a letter to the GACA (see Figure 4.30.2.1, Sample Letter of Application).

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2) The GACA receives request for approval letter which as a minimum must include the following information.

- Identification of the ATD
- A list of the intended uses of the ATD
- A list of the ATD components
- A copy of the manufacturer's Qualification and Approval Guide (QAG) for the requested ATD

3) The requester must also be able to demonstrate that the ATD is able to:

- Provide training in all elements in which it will be used
- Successfully pass a start-up self-test of control inputs by the computer and software
- Remain in the approved configuration during the training session

4) The GACA assesses the ATD in accordance with the applicable QAG. If the ATD is found to be acceptable, GACA will issue a letter of approval to the applicant.

### **4.30.2.13. TASK OUTCOME.**

#### **A. Complete the GACA Activity Report (GAR).**

#### **B. Complete the Task.** Completion of this task will result in the following:

- Issue letter of approval of the ATD
- A denial letter issued to the applicant

### **4.30.2.15. FUTURE ACTIVITIES.**

- Reassessment of the ATD if the manufacturer or user makes changes to the ATD
- Normal surveillance of the ATD in use by pilot training organizations

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**Figure 4.30.2.1. Sample Letter of Application**

Date:

Dear [NAME]:

[Name of manufacturer/developer] requests an evaluation of its [make, model, serial number] proposed aviation training device (ATD) for approval by the President at [location where the evaluation is requested]. This device is fully described in the accompanying descriptive literature and performance attributes, and photographs. This device has been evaluated by the manufacturer and is believed to adequately meet the applicable requirements for approval as an ATD under GACAR Part 60. Appropriate hardware and software configuration control procedures have been established and are listed for your review and approval.

The following [manufacturer's/developer's name] personnel have assessed this device:

Name: \_\_\_\_\_ Qualification & Title: \_\_\_\_\_

Name: \_\_\_\_\_ Qualification & Title: \_\_\_\_\_

Whom attest that:

It conforms to [the generic or specific make, model, category and class of aircraft] and that the simulated systems and subsystems function equivalently to those found in that aircraft.

The performance and handling qualities have been assessed and have been determined to adequately represent the designated category and class of aircraft.

Sincerely,

[Signature of Manufacturer or Authorized Representative]

[Printed Name of Signatory]

Enclosure—QAG for [model name of device]

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**CHAPTER 30. FLIGHT CREW TRAINING DEVICES**

**Section 3. Approval of a Flight Training Device (FTD)**

**NOTE:** This guidance to be developed at a later date.

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**CHAPTER 30. FLIGHT CREW TRAINING DEVICES**

**Section 4. Approval of a Full Flight Simulator (FFS)**

**NOTE:** This guidance to be developed at a later date.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY -- ADMINISTRATION**

#### **CHAPTER 31. TRANSPORTATION OF DANGEROUS GOODS BY AIR**

##### **Section 1. Evaluate the Transportation of Dangerous Goods**

**4.31.1.1. BACKGROUND.** This chapter provides guidance to aviation safety inspectors (Inspectors) regarding the transportation of dangerous goods by air. General Authority of Civil Aviation Regulation (GACAR) Part 109 applies to all persons transporting dangerous goods by air. GACAR Part 109 also applies to all operators certificated under GACAR Part 119 even if they do not transport dangerous goods by air. GACAR Part 109 also applies to persons offering and preparing dangerous goods for transportation by air. Section 1 of this chapter addresses subjects applicable to all operators - both those who are authorized to carry dangerous goods by air and those operators who are not authorized to carry dangerous goods by air. Section 2 of this chapter addresses subjects applicable to persons offering or preparing dangerous goods for transportation by air. Principal inspectors (PIs) should ensure that all operators in the Kingdom of Saudi Arabia (KSA) are aware of the regulations governing the transportation of dangerous goods by air. Operator's compliance with the dangerous goods employee training requirements contained in GACAR Part 109, Subpart F, Dangerous Goods Training, is mandatory. Operators are responsible for developing and implementing a system that will allow them to remain current with the regulations that are updated and/or changed.

**4.31.1.3. AUTHORIZATIONS REQUIRED.** Within the KSA, Civil Aviation Law, Article 12, Dangerous Goods states "Subject to applicable international laws on carriage of dangerous goods, no dangerous goods may be carried on board an aircraft unless permitted by the Authority in accordance with procedures specified in the Regulations."

##### **A. "WILL NOT CARRY" OPERATORS.**

1) Operators certificated under GACAR Part 119 or 133, and foreign air carriers authorized under GACAR Part 129, who have not been authorized by the President to transport dangerous goods by air, need only comply with the following sections of GACAR Part 109:

- GACAR § 109.83, Information for Passengers
- GACAR § 109.85, Information for Other Persons

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- GACAR §§ 109.101 through 109.103, Subpart F – Dangerous Goods Training
- GACAR § 109.113, Operator's Dangerous Goods Manual
- GACAR § 109.121, Dangerous Goods Accident and Incident Reporting Requirements
- GACAR § 109.123, Dangerous Goods Discrepancy Reporting
- GACAR § 109.125, Dangerous Goods Training Records

**NOTE:** All “will not carry” operators noted above must meet these basic requirements in order to be issued a certificate under GACAR Part 119 or 133 or authorizing document under GACAR Part 129.

### B. “WILL CARRY” OPERATORS.

1) Operators not certificated under GACAR Part 119 or 133, and foreign-registered aircraft not authorized under GACAR Part 129, who transport dangerous goods by air, need only comply with the following sections of GACAR Part 109:

- GACAR § 109.3, General Limitations on the Transport of Dangerous Goods
- GACAR § 109.5, Exceptions for Operators, Crew Members and Passengers
- GACAR § 109.89, Information in the Event of an Aircraft Accident or Incident
- GACAR § 109.91, Information in the Event of an In-Flight Emergency
- GACAR § 109.121, Dangerous Goods Reporting Requirements

**NOTE:** These operators are *not* required to have a special authorization to transport dangerous goods by air.

2) Operators certificated under GACAR Part 119 or 133 and wishing to transport dangerous goods by air must comply with all applicable provisions of GACAR Part 109 and be authorized by the President under GACAR § 109.43 to transport dangerous goods by air. Authorizations to transport dangerous goods by air are conveyed to operators via

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OpSpec A55.

3) Foreign air carriers authorized under GAACAR Part 129 and wishing to transport dangerous goods by air must be authorized by the President under GACAR § 109.43 to transport dangerous goods by air. Foreign air carriers who have been authorized to transport dangerous goods by air by their National Authority are eligible for an authorization from the President without further showing. Authorization to transport dangerous goods by air is conveyed to foreign air carriers in the authorizing document issued under GACAR Part 129.

**4.31.1.5. PROCEDURES FOR APPROVAL OF DANGEROUS GOODS TRAINING.** When a principal operations inspector (POI) receives a proposal for updated or revised dangerous goods training from an operator, the POI should review the proposal for compliance to the rule. The operator should coordinate with the POI as necessary, to formulate a satisfactory revision to the training program. Once the POI is satisfied with the training proposal, he will approve it. The POI then approves the implementation of the training in accordance with Subpart R of GACAR Part 121, Part 125 or Part 135, or Subpart B of Part 133, as appropriate. Details of the dangerous goods training program must be included in the dangerous goods manual. The initial approval of the training is usually done at the same time as the review and acceptance of the dangerous goods manual.

**4.31.1.7. PROCEDURES FOR APPROVAL OF DANGEROUS GOODS MANUAL.** Operators must design and produce a dangerous goods manual as required by GACAR § 109.113. The dangerous goods manual may be a separate manual or incorporated as part of the Operations Manual required under GACAR Part 121, 125, 129, 133, or 135. When the POI receives a dangerous goods manual for review from an operator, he will review the contents of the manual or revision and consult with the Director, Flight Operations Division, when necessary. The operator should be contacted, when questions relative to the manual or revision arise, in order to formulate a dangerous goods manual that is satisfactory. Once the POI is satisfied with the manual he will approve the manual.

**4.31.1.9. DANGEROUS GOODS PROGRAM REQUIREMENTS FOR OPERATORS NOT ACCEPTING DANGEROUS GOODS FOR TRANSPORTATION.** Operators who do not transport dangerous goods by air must provide procedures and instructions in the dangerous goods manual required under GACAR § 109.113, as follows:

- Procedures and instructions so that all personnel responsible for accepting and handling any cargo or packaged materials receive adequate training on the recognition of items classified as

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dangerous goods

**NOTE:** “Adequate” is defined in an operational sense to mean the demonstrated ability of required personnel to identify such items.

- Procedures and instructions so that no packages are accepted by the operator that contain dangerous goods
- Procedures and instructions for reporting that damaged packages found to contain, or that are suspected of containing, dangerous goods are reported in compliance with GACAR §§ 109.85, 109.89, 109.121 and 109.123
- Procedures and instructions to see that all Company Material (COMAT) containing dangerous goods will be transferred to a different mode of transportation (e.g., ground) and/or an operator that is authorized to transport dangerous goods by air
- Initial and Recurrent Training, as required by GACAR Part 109, Appendix B
- Other required items, such as Provision of Information, Recordkeeping, and Reporting

### **4.31.1.11. DANGEROUS GOODS PROGRAM REQUIREMENTS FOR OPERATORS ACCEPTING DANGEROUS GOODS FOR TRANSPORTATION.**

A. Operators who transport dangerous goods by air must provide instruction and procedures on the following basic subjects:

- 1) Procedures and instructions on acceptance of dangerous goods for air shipment as required by GACAR § 109.61.
- 2) Procedures and instructions on inspecting for damage, leakage and contamination as required by GACAR § 109.63.
- 3) Procedures and instructions on land stowage restrictions as required by GACAR § 109.65.
- 4) Procedures and instructions on removal of contamination as required by GACAR § 109.67.

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5) Initial and recurrent training as required by GACAR Part 109, Appendix B.

6) Recordkeeping, as required by GACAR Part 109.

**B. Storage of Dangerous Goods.** Operators should provide specific guidance on the storage of dangerous goods. This guidance should include instructions for Class 8 (corrosive), Class 7 (radioactive), and Class 6, Division 6.1 (poisonous) materials as discussed below:

1) The storage of Class 8 (corrosive) materials next to, or in contact with, Class 4, Division 4.2 or 4.3 (flammable) solids or Class 5, Division 5.1 (oxidizing) materials must be prevented. The segregation prescribed in the Technical Instructions must be maintained for all packages containing hazmat that might react dangerously when stored in a position that causes or contributes to leakage.

2) The storage of Class 7 (radioactive) materials labeled yellow II and/or yellow III will not exceed a transport index (TI) of 50 in a single storage location. These materials are stored in an area that is isolated from people and does not permit pedestrian traffic or loitering. The minimum separation distances prescribed in the Technical Instructions should be maintained between radioactive materials labeled yellow II and yellow III and packages of undeveloped film.

**NOTE:** Class 7 radioactive materials may not be transported without an authorization from the Ministry of Health.

3) Packages bearing a Class 6, Division 6.1 poison label will not be stored in the same location as foodstuffs, feeds, or any edible materials intended for consumption by either humans or animals.

**C. Loading of Dangerous Goods.** Operators must establish specific procedures for loading dangerous goods. This guidance should include:

1) Loading of dangerous goods in aircraft in accordance with GACAR § 109.65

2) Loading and carriage of dangerous goods in cargo-only aircraft, when other means of transportation are not available or impracticable, in accordance with GACAR § 109.65(c)

3) Loading of radioactive materials in aircraft in accordance with GACAR § 109.65(d)(3) to

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ensure that the limitations in the Technical Instructions are followed and that radioactive packages are transported in accordance with the requirements of the rules

4) Loading of dangerous goods in cargo compartments or freight containers within cargo compartments, in accordance with GACAR § 109.65

5) A prohibition against loading packages bearing a poison label in the same compartment that holds foodstuffs, feeds, or any edible materials intended for consumption by humans or animals unless both commodities are in separate, closed-unit load devices known as freight containers

**NOTE:** Class 1 explosives may not be transported within the Kingdom of Saudi Arabia without an authorization from the Ministry of Interior..

**D. Written Notification of Pilot In Command (PIC).** Operators must establish procedures for notifying the PIC when dangerous goods are carried on board the aircraft in accordance with GACAR §§ 109.87 and 109.81.

**E. Reporting Dangerous Goods Incidents.** The dangerous goods information must include company procedures for reporting dangerous goods incidents, in compliance with GACAR § 109.89 and should further include the procedures for reporting discrepancies, in compliance with GACAR §§ 109.121 and 109.123.

**F. Damage to Dangerous Goods Packages.** The operator must develop procedures for handling damaged packages, radioactive contamination, and substances in Class 6, Division 6.2 (infectious substances), as found in GACAR § 109.65. The information should include a list of telephone numbers and addresses of organizations that can provide technical advice on clean-up techniques and precautions to minimize the possibility of injury to employees and the general public. Appropriate organizations for such advice include the following:

- CHEMTREC
- The KSA Ministry of Health
- The Center for Disease Control and Prevention (CDC) of the U.S. Department of Health and Human Services (HHS), Atlanta, Georgia, USA

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**4.31.1.13. VIOLATIONS AND INVESTIGATIONS.** When an aviation safety inspector (Inspector) becomes aware of a suspected dangerous goods violation, the Inspector shall proceed in accordance with the compliance enforcement procedures prescribed in Volume 13 of this handbook.

**4.31.1.15. ICAO DOCUMENTS AND OTHER GUIDANCE.**

**A. ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air.** The Technical Instructions (ICAO Doc 9284), amplify the basic provisions of Annex 18 to the Convention on International Civil Aviation, and contain detailed instructions necessary for the safe international transport of dangerous goods by air. The ICAO Technical Instructions are incorporated by reference into GACAR Part 109.

**B. Other Reference Documents Relating To The Carriage of Dangerous Goods By Air.** ICAO Annex 18, Safe Transport of Dangerous Goods by Air.

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**CHAPTER 31. TRANSPORTATION OF DANGEROUS GOODS BY AIR**

**Section 2. Evaluate the Preparation of Dangerous Goods**

**NOTE:** This guidance to be developed at a later date.

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY -- ADMINISTRATION**

#### **CHAPTER 32. MANAGEMENT OF AVIATION FATIGUE**

##### **Section 1. Understanding and Applying Part 117**

**4.32.1.1. GENERAL.** This section provides guidance on applying the requirements prescribed in GACAR Part 117 for managing and mitigating flight crew member fatigue.

**4.32.1.3. UNDERSTANDING FATIGUE.** Fatigue is characterized by a general lack of alertness and degradation in mental and physical performance. Fatigue manifests in the aviation context not only when pilots fall asleep in the cockpit in flight, but perhaps more importantly, when they are insufficiently alert during take-off and landing. Reported fatigue-related events have included procedural errors, unstable approaches, lining up with the wrong runway, and landing without clearances.

**A. Types of Fatigue.** There are three types of fatigue: transient, cumulative, and circadian.

- 1) Transient fatigue is acute fatigue brought on by extreme sleep restriction or extended hours awake within 1 or 2 days.
- 2) Cumulative fatigue is fatigue brought on by repeated mild sleep restriction or extended hours awake across a series of days.
- 3) Circadian fatigue refers to the reduced performance during nighttime hours, particularly during an individual's Window of Circadian Low (WOCL) (typically between 0200 and 0600.)

**B. Fatigue Symptoms.** Common symptoms of fatigue include:

- Measurable reduction in speed and accuracy of performance,
- Lapses of attention and vigilance,
- Delayed reactions,
- Impaired logical reasoning and decision-making, including a reduced ability to assess risk or appreciate consequences of actions,
- Reduced situational awareness, and
- Low motivation to perform optional activities.

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**C. Factors Contributing to Fatigue.** A variety of factors contribute to whether an individual experiences fatigue as well as the severity of that fatigue. The major factors affecting fatigue include:

- 1) Time of Day. Fatigue is, in part, a function of circadian rhythms. All other factors being equal, fatigue is most likely and, when present, most severe between the hours of 0200 and 0600.
- 2) Amount of Recent Sleep. If a person has had significantly less than 8 hours of sleep in the past 24 hours, he or she is more likely to be fatigued.
- 3) Time Awake. A person who has been continually awake for a long period of time since his or her last major sleep period is more likely to be fatigued.
- 4) Cumulative Sleep Debt. For the average person, cumulative sleep debt is the difference between the amount of sleep a person has received over the past several days, and the amount of sleep he or she would have received with 8 hours of sleep a night.
- 5) Time on Task. The longer a person has continuously been doing a job without a break, the more likely he or she is to be fatigued.
- 6) Individual Variation. Individuals respond to fatigue factors differently and may become fatigued at different times, and to different degrees of severity under the same circumstances.

**D. Managing Fatigue.** Scientific research and experimentation have consistently demonstrated that adequate sleep sustains performance. For most people, 8 hours of sleep in each 24-hour period sustains performance indefinitely. Sleep opportunities during the WOCL are preferable because sleep that occurs during the WOCL provides the most recuperative value. Within limits, shortened periods of nighttime sleep may be nearly as beneficial as a consolidated sleep period when augmented by additional sleep periods, such as naps before evening departures, during flights with augmented flight crews, and during layovers. Sleep should not be fragmented with interruptions. In addition, environmental conditions such as temperature, noise, and turbulence impact how beneficial sleep is and how performance is restored. When a person has accumulated a sleep debt, recovery sleep is necessary to fully restore the person's "sleep reservoir." Recovery sleep should include at least one physiological night; that is, one sleep period during nighttime hours in the time zone in which the individual is acclimated. The average person requires in

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excess of 9 hours of sleep a night to recover from a sleep debt.

**E. Additional References.** More information on fatigue may be found in the current edition of the following documents:

- FAA Advisory Circular (AC) 120-100, Basics of Aviation Fatigue;
- FAA AC 117-1, Flightcrew Member Rest Facilities;
- FAA AC 117-2, Fatigue Education and Awareness Training Program; and
- FAA AC 117-3, Fitness for Duty.

### **4.32.1.5. GACAR PART 117 APPLICABILITY.**

**A. GACAR Part 117** applies to all passenger-carrying operations (scheduled or unscheduled) and all-cargo operations conducted by GACAR Part 121 certificate holders except for special unscheduled operations. GACAR Part 117 does not prescribe different limitations for each kind of operation being conducted under GACAR Part 121. Therefore, a GACAR Part 121 certificate holder conducting any operations (except for special unscheduled operations) must conduct those operations in accordance with the provisions prescribed in GACAR Part 117.

NOTE: The application of GACAR Part 117 to all-cargo operations is different than how the applicability is applied under FAR Part 121.

**B. Mixed Types of Operations.** GACAR Part 121 certificate holders that conduct mixed types of operations (i.e., scheduled or unscheduled, and special unscheduled ) must comply with the provisions of GACAR Part 117 for each scheduled or unscheduled operation being conducted (except for special unscheduled operations). For certificate holder's conducting special unscheduled operations, the certificate holder may elect to apply the requirements and limitations prescribed in part 117 to its special unscheduled operations. Certificate holders conducting mixed types of operations must develop a method acceptable to the President for tracking and recording the flight crew members' flight, duty, and rest times. This recordkeeping system must be applicable for both GACAR Parts 117 and 121 to ensure compliance with the applicable part under which the flight is operated. These records must be made available to the President for inspection as a means of demonstrating compliance with the applicable rules.

**C. Cumulative Limitations Relative to All Flight Operations.** The cumulative limitations prescribed in GACAR § 117.23 include all flying by flight crew members on behalf of any

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certificate holder. Thus, even if a flight is not operated pursuant to GACAR Part 117, that flight still counts for purposes of the cumulative limitations of GACAR Part 117 if it is flown on behalf of a certificate holder or under GACAR Part 91. However, the GACAR Part 117 cumulative limits can be exceeded while the flight crew member is on a non-GACAR Part 117 flight segment; that flight crew member is simply prohibited from beginning the next GACAR Part 117 flight segment if he cannot complete the GACAR Part 117 segment within the pertinent cumulative limits.

**4.32.1.7. DEFINITIONS.** In addition to the definitions in GACAR § 1.1, the following definitions apply to GACAR Part 117.

**A. Acclimated.** Acclimated means a condition in which a flight crew member has been in a theater for 72 hours or has been given at least 36 consecutive hours free from duty.

**B. Aerodrome/Standby Reserve.** Aerodrome/standby reserve means a defined duty period during which a flight crew member is required by a certificate holder to be at an aerodrome for a possible assignment.

**C. Augmented.** Augmented flight crew means a flight crew that has more than the minimum number of flight crew members required by the airplane type certificate to operate the aircraft to allow a flight crew member to be replaced by another qualified flight crew member for in-flight rest.

**D. Calendar Day.** Calendar day means a 24-hour period from 0000 through 2359 using Coordinated Universal Time or local time.

**E. Certificate Holder.** Certificate holder means a person who holds or is required to hold an air carrier certificate or operating certificate issued under GACAR Part 119.

**F. Deadhead Transportation.** Deadhead transportation means transportation of a flight crew member as a passenger or non-operating flight crew member by any mode of transportation, as required by a certificate holder, excluding transportation to or from a suitable accommodation. All time spent in deadhead transportation is duty and is not rest. For purposes of determining the maximum flight duty period in Table B of this part, deadhead transportation is not considered a flight segment.

**G. Duty.** Duty means any task that a flight crew member performs, as required by the certificate

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holder including but not limited to flight duty period, flight duty, pre- and post-flight duties, administrative work, training, deadhead transportation, aircraft positioning on the ground, aircraft loading, and aircraft servicing.

**H. Fatigue.** Fatigue means a physiological state of reduced mental or physical performance capability resulting from lack of sleep or increased physical activity that can reduce a flight crew member's alertness and ability to safely operate an aircraft or perform safety-related duties.

**I. Fatigue Risk Management System (FRMS).** Fatigue Risk Management System (FRMS) means a management system for a certificate holder to use to mitigate the effects of fatigue in its particular operations. It is a data driven process and a systematic method used to continuously monitor and manage safety risks associated with fatigue-related error.

**J. Fit for Duty.** Fit for duty means physiologically and mentally prepared, and capable of performing assigned duties at the highest degree of safety.

**K. Flight Duty Period (FDP).** Flight duty period (FDP) means a period that begins when a flight crew member is required to report for duty with the intention of conducting a flight, a series of flights, or positioning or ferrying flights, and ends when the aircraft is parked after the last flight and there is no intention for further aircraft movement by the same flight crew member. A flight duty period includes the duties performed by the flight crew member on behalf of the certificate holder that occur before a flight segment or between flight segments without a required intervening rest period. Examples of tasks that are part of the flight duty period include deadhead transportation, training conducted in an aircraft or flight simulator, and aerodrome/standby reserve, if the above tasks occur before a flight segment or between flight segments without an intervening required rest period.

**L. Flight Time.** Flight time means pilot time that commences when an aircraft moves under its own power for the purpose of flight and ends when the aircraft comes to rest after landing.

**M. Home Base.** Home base means the location designated by a certificate holder where a flight crew member normally begins and ends his or her duty periods.

**N. Lineholder.** Lineholder means a flight crew member who has an assigned flight duty period and is not acting as a reserve flight crew member.

**O. Long-Call Reserve.** Long-call reserve means that, prior to beginning the rest period required

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by GACAR § 117.25, the flight crew member is notified by the certificate holder to report for a flight duty period following the completion of the rest period.

**P. Physiological Night's Rest.** Physiological night's rest means 10 hours of rest that encompasses the hours of 0100 and 0700 at the flight crew member's home base, unless the individual has acclimated to a different theater. If the flight crew member has acclimated to a different theater, the rest must encompass the hours of 0100 and 0700 at the acclimated location.

**Q. Report Time.** Report time means the time that the certificate holder requires a flight crew member to report for an assignment.

**R. Reserve Availability Period (RAP).** Reserve availability period (RAP) means a duty period during which a certificate holder requires a flight crew member on short-call reserve to be available to receive an assignment for a flight duty period.

**S. Reserve Flight Crew Member.** Reserve flight crew member means a flight crew member who a certificate holder requires to be available to receive an assignment for duty.

**T. Rest Facility.** Rest facility means a bunk or seat accommodation installed in an aircraft that provides a flight crew member with a sleep opportunity.

- Class 1 rest facility means a bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled, allows the flight crew member to control light, and provides isolation from noise and disturbance.
- Class 2 rest facility means a seat in an aircraft cabin that allows for a flat or near flat sleeping position, is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation, and is reasonably free from disturbance by passengers or flight crew members.
- Class 3 rest facility means a seat in an aircraft cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.

**U. Rest Period.** Rest period means a continuous period determined prospectively during which the flight crew member is free from all restraint by the certificate holder, including freedom from present responsibility for work should the occasion arise.

**V. Scheduled.** Scheduled means to appoint, assign, or designate for a fixed time.

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**W. Short-Call Reserve.** Short-call reserve means a period of time in which a flight crew member is assigned to a reserve availability period.

**X. Split-Duty.** Split-duty means a flight duty period that has a scheduled break in duty that is less than a required rest period.

**Y. Suitable Accommodation.** Suitable accommodation means a temperature-controlled facility with sound mitigation and the ability to control light that provides a flight crew member with the ability to sleep either in a bed, bunk, or in a chair that allows for flat or a near-flat sleeping position. Suitable accommodation only applies to ground facilities and does not apply to aircraft onboard rest facilities.

**Z. Theater.** Theater means a geographical area in which the distance between the flight crew member's flight duty period departure point and arrival point differs by no more than 60 degrees longitude.

**AA. Unforeseen.** Unforeseen operational circumstance means an unplanned event of insufficient duration to allow for adjustments to schedules, including unforecast weather, equipment malfunction, or air traffic delay that is not reasonably expected.

**BB. Window of Circadian Low (WOCL).** Window of circadian low (WOCL) means a period of maximum sleepiness that occurs between 0200 and 0559 during a physiological night.

### 4.32.1.9. FITNESS FOR DUTY (GACAR § 117.5).

**A. Minimum Rest Opportunity Prior to Starting an FDP or Reserve Period.** GACAR Part 117 requires the flight crew member to receive a minimum of a 10-hour rest period immediately before reporting for a FDP or reserve period. This rest period must provide the flight crew member with 8 uninterrupted hours of sleep opportunity.

**B. Fitness for Duty: Flight Crew Member's Responsibility.** It is the responsibility of the flight crew member to use their assigned sleep opportunity to gain the proper rest prior to reporting for an FDP. GACAR Part 117 requires each flight crew member to be fit for duty when reporting for any FDP, well rested, and prepared to perform his or her duties, as assigned. This requirement rests solely with the flight crew member.

**C. Fitness for Duty: Joint Responsibility.** GACAR Part 117 assigns joint responsibility

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between the flight crew member and the certificate holder with regard to fitness for duty. GACAR § 117.5(b) establishes this joint responsibility by prohibiting the certificate holder from assigning, and the flight crew member from accepting, an assignment to a flight duty period if that flight crew member has reported too fatigued to safely perform his or her assigned duties.

**D. Removing a Fatigued Flight Crew Member from Duty.** GACAR § 117.5(c) states that the certificate holder may not permit a flight crew member to continue an FDP if that flight crew member has reported him or herself too fatigued to safely continue their assigned duties.

**E. Affirming Fitness for Duty.** Each flight crew member must affirmatively state he or she is fit for duty prior to commencing a flight. This statement, affirming the flight crew member's fitness for duty, is signified by that flight crew member signing the flight's dispatch/release, as appropriate, attesting they are fit for duty. While a flight crew member may have reported fit for duty at the beginning of their FDP, extenuating circumstances could have occurred during their FDP resulting in the flight crew member becoming too fatigued to continue their assigned FDP. GACAR Part 117 contemplates this situation and, therefore, requires each flight crew member to attest their fitness for duty at the beginning of each flight segment for which he or she is assigned.

**F. Demonstrating Compliance with GACAR § 117.5.** The certificate holder will be responsible for developing the following:

- 1) A statement in the certificate holder's operating manual stating that it is the responsibility of each flight crew member to be fit for duty prior to reporting for any FDP.
- 2) A statement in the certificate holder's operating manual that the certificate holder may not assign, and that flight crew member may not accept, an assignment for an FDP if that flight crew member has reported him or herself too fatigued to perform or continue an assigned FDP.
- 3) A statement in the certificate holder's operating manual declaring that the certificate holder will not permit a flight crew member to continue an FDP if that flight crew member has reported him or herself too fatigued to continue an assigned FDP.
- 4) An acceptable method and applicable procedures for flight crew members to, as part of the dispatch/flight release, affirmatively attest they are fit for duty for each flight segment they are assigned as operating flight crew member. These procedures will be reflected in the

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certificate holder's operating manual.

**G. Additional References.** More information on fitness for duty may be found in the current edition of the following documents:

- FAA AC 117-3, Fitness for Duty.

**4.32.1.11. FATIGUE RISK MANAGEMENT SYSTEMS (FRMS) (GACAR § 117.7).** Each GACAR Part 121 certificate holder conducting operations under GACAR Part 117 must comply with the applicable requirements and limitations of GACAR Part 117, unless otherwise approved under an FRMS under GACAR Part 5. The FRMS is an alternative fatigue management method developed by the certificate holder and approved by the GACA with specific conditions and limitations applicable to the authorization that require certificate holder compliance when operating under that FRMS authorization.

**A. FRMS as an Alternate Fatigue Management Method.** An FRMS is an optional approach to prescriptive regulations. A certificate holder seeking to exceed a limitation in GACAR Part 117 would do so under a GACA authorization issued under GACAR Part 5 and documented in OpSpec A10. An FRMS is largely developed as an alternative to prescriptive limitations based upon objective performance standards. A certificate holder may be authorized to apply an FRMS to any part or all of its operation, provided that the certificate holder demonstrates an effective FRMS that meets or exceeds the safety standards afforded by the prescriptive limitations.

**B. FRMS as a Management System.** An FRMS is a management system for a certificate holder to use to mitigate the effects of fatigue in its particular operations. An FRMS is a data-driven system, based largely upon scientific principles and operational knowledge that allows for continuous monitoring and management of safety risks associated with fatigue-related error. An FRMS is a fatigue mitigation tool that minimizes the acute and chronic sources of fatigue and manages the potential risks associated with fatigue. The FRMS is part of a repetitive performance improvement process that leads to continuous safety enhancements by identifying and addressing fatigue factors across time and changing physiological and operational circumstances. The objective of the FRMS is to manage, monitor, and mitigate the effects of fatigue to improve flight crew member alertness and reduce performance errors.

**C. FRMS Applications.** FRMS applications are submitted to GACA Flight Operations for review, processing, and approvals.

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### **D. Reserved.**

**E. Operating Under the Provisions of an FRMS.** When operating under an FRMS authorization, the certificate holder must designate on the dispatch/release that the flight is operating under the specific FRMS authorization.

**F. Additional References.** More information on FRMS may be found in the current edition of FAA AC 120-103, Fatigue Risk Management Systems for Aviation Safety and ICAO Doc. 9966, FRMS - Manual for Regulators.

### **4.32.1.13. FATIGUE EDUCATION AND AWARENESS TRAINING PROGRAMS (GACAR § 117.9).**

Each GACAR Part 121 certificate holder operating under GACAR Part 117 must develop, implement, update, and maintain a GACA-approved Fatigue Education and Awareness Training Program, as prescribed in GACAR § 117.9. Fatigue training is an essential element to mitigating potential fatigue risks. These training requirements are designed to provide annual education and awareness training to all employees of the certificate holder responsible for administering the provisions of GACAR Part 117, including flight crew members, dispatchers, individuals directly involved in the scheduling of flight crew members, individuals directly involved in operational control, and any employee providing direct management oversight of those areas. The objective of the training program is to educate and improve the awareness of these employee groups in an effort to increase their understanding of the effects of fatigue relative to the safety of flight.

**A. Training Program Elements.** The fatigue-training requirements must be incorporated into its operator-specific FAA approved ground training curriculum. The frequency of this training must be every 12 calendar months, unless otherwise required by the certificate holder's operations specifications. At a minimum, the Fatigue Education and Awareness Training program must include the following:

- Review of FAA flight, duty, and rest regulatory requirements.
- Awareness of the certificate holder's fatigue-related policies and procedures, and the responsibilities of management and employees to mitigate or manage the effects of fatigue and improve flight crew member flight deck alertness.
- The basics of fatigue, including sleep fundamentals and circadian rhythms.
- The causes and awareness of fatigue.
- The effects of operating through multiple time zones.
- The effects of fatigue relative to pilot performance.

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- Fatigue countermeasures, prevention, and mitigation.
- The influence of lifestyle, including nutrition, exercise, and family life on fatigue.
- Familiarity with sleep disorders.
- The effects of fatigue as a result of commuting.
- Pilot responsibility for ensuring adequate rest and fitness for duty.
- Operational procedures to follow when one identifies, or suspects, fatigue risk in oneself or others.
- Incorporate lessons learned regarding the effects of fatigue and mitigation initiatives relative to the certificate holder's operations.
- The certificate holder must use a methodology that continually assesses the effectiveness of their training program.

**B. Training Program Audience.** The training applies to all employees responsible for administering the provisions of the new rule, including flight crew members, dispatchers, individuals directly involved in the scheduling of flight crew members, individuals directly involved in operational control, and any employee providing direct management oversight of those areas.

**C. Training Program Updates.** Each GACAR Part 121 certificate holder operating under GACAR Part 117 must update their Fatigue Education and Awareness Training Program every 24 calendar-months. The certificate holder's education and training program expires 24-calendars after approval. Thus, each certificate holder must update their education and training program every 24-calandar months. The certificate holder should submit their update to the GACA for review 12 months prior to the expiration date of their training program.

**D. GACA-Approval of the Training Program.** The certificate holder's initial fatigue education and awareness training program and all non-minor changes to that program must receive GACA approval per GACAR § 117.9(a) prior to implementation. Minor changes to the training program only need to be accepted by the GACA and need not go through the approval process. For the purposes of clarity, a minor change includes correcting grammatical errors, typos, and non substantive data. A change to any element of the training program would be considered a major change. A major change to the fatigue education and awareness training program would be considered a new program, and this change would have to be approved by the GACA before it is implemented.

**E. Demonstrating Compliance With GACAR § 117.9.** The certificate holder will be

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responsible for the following:

- 1) An initial fatigue education and awareness training program that is consistent with the training elements identified in FAA AC 117-2.
- 2) Placing the following statement in the training program that identifies the target audience: “The training applies to all employees responsible for administering the provisions of the new rule, including flight crew members, dispatchers, individuals directly involved in the scheduling of flight crew members, individuals directly involved in operational control, and any employee providing direct management oversight of those areas.”
- 3) A statement in the certificate holder’s training program requiring them to submit an update to their fatigue education and awareness training program every 24-calendar months from the date of initial approval of the fatigue education and awareness training program. As prescribed in GACAR § 117.9(c)(1)(2), updates should be submitted to the GACA at least 12 months prior to the 24-calendar month expiration date.

**F. Additional References.** More information on Fatigue Education and Awareness Training Programs may be found in the current editions of:

- FAA AC 120-100, Basics of Aviation Fatigue;
- FAA AC 117-2, Fatigue Education and Awareness Training Programs.

### 4.32.1.15. FLIGHT TIME LIMITATIONS (GACAR § 117.11).

**A. Background.** Studies have shown that after a person works for approximately eight or nine hours during a day, the risk of an accident increases exponentially for each additional hour worked. According to a series of studies that examined the national rate of accidents as a function of the amount of hours worked, the risk of an accident in the 12th hour of a work shift is more than double the risk of an accident in the 8th hour of a work shift. To mitigate the risk of fatigue setting in while on duty, the flight time limits in Table A of GACAR Part 117 (unaugmented operations) restrict a flight crew member’s time on task (flight time) to either 8 or 9 hours during the unaugmented flight crew member’s FDP.

NOTE: Augmented flight crew operations provide an added layer of safety by increasing the number of flight crew members assigned to a flight or series of flights, above the required crew

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complement. This enables the flight crew members to take an in-flight rest period, thus reducing fatigue and improving flight crew member alertness. By using augmentation, the certificate holder gains additional flexibility as a result of longer FDPs and increased flight time limits. Augmentation adds a higher level of safety to compensate for the longer FDP and flight time limits.

**B. Flight Time Limitations.** GACAR Part 117 prescribes separate FTLs for unaugmented and augmented flight crew member operations.

1) Unaugmented Flight Crew Member Operations. Unaugmented FTLs are prescribed in GACAR § 117.11(a)(1). The flight crew member's applicable FTLs are predicated upon the "Time of Report," which is limited to eight or nine hours. If the flight crew member's time of report occurs between 2000 hours and 0459 hours, the limit is eight hours during that FDP. If, however, the flight crew member's time of report occurs between 0500 and 1959, then the FTL is nine hours for that FDP. (See Figure 4.32.1.1, Table A to GACAR Part 117-Maximum Flight Time Limits for Unaugmented Operations).

2) Augmented Flight Crew Member Operations. FTLs for augmented flight crew member operations are prescribed in GACAR § 117.11(a)(2)(3).

- a) Three pilots: a flight crew consisting of three pilots is limited to 13 hours of flight time during that FDP.
- b) Four pilots: a flight crew consisting of four pilots is limited to 17 hours of flight time during that FDP.

**Figure 4.32.1.1. Table A to Part 117 - Maximum Flight Time Limits for Unaugmented Operations**

<b>Table A to Part 117 – Maximum Flight Time Limits for Unaugmented Operations</b>	
<b>Time of report (acclimated)</b>	<b>Maximum flight time (hours)</b>
0000-0459	8
0500-1959	9
2000-2359	8

**C. Determining FTLs.** FTLs rest within the limits of the flight crew member's assigned FDP. An

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FDP is a period that begins when a flight crew member is required to report for duty with the intention of conducting a flight or series of flights.

- 1) Unaugmented Flight Crew Member. The maximum FTL for an unaugmented flight crew member may be found in Table A of GACAR Part 117 (see Figure 4.32.1.1). The Time of Report is the actual time in which the flight crew member reports for their FDP.
- 2) Augmented Flight Crew Member. The maximum FTL is determined based on the time in which the flight crew member reports for duty. An augmented flight crew member's FTLs may be found in GACAR § 117.11(a)(2)(3).

**D. FTL Constraints.** As previously stated, a flight crew member's FTL must be within the limits of their maximum applicable FTL limit. A flight crew member may not take off on a flight segment if he or she does not have a reasonable expectation that the flight segment will be completed within the maximum FTL limit.

**E. FTL Extensions.** If unforeseen operational circumstances arise after takeoff a flight crew member may exceed the maximum flight time and the cumulative flight time limits (as prescribed in GACAR § 117.23(b)) to the extent necessary to safely land the aircraft at the next destination aerodrome or alternate, as appropriate.

**F. Reporting Flight Time Extensions.** In the event a flight crew member's FTL is extended, the certificate holder must report that extension to the GACA within 10 days following the flight time extension. The report must include a description of the extended flight time limitation and the circumstances surrounding the need for the extension.

**G. Cumulative Flight Time Limits.** As prescribed in GACAR § 117.23(b)(1)(2), cumulative FTLs function using the following rolling windows: 672 consecutive hours (rolling 28-day period) or 365 consecutive calendar-day (a rolling 365-day period). A flight crew member's cumulative FTLs shall not exceed:

- 1) 100 hours in any 672 consecutive hours, or
- 2) 1000 hours in any 365 consecutive calendar-day period.

**H. Demonstrating Compliance With GACAR § 117.11.** The certificate holder will be responsible for implementing and demonstrating the following:

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- 1) A method for tracking unaugmented and augmented flight crew member's flight times to ensure compliance with the applicable limits of GACAR § 117.11(a)(1)(2)(3).
- 2) A method for ensuring compliance with the cumulative FTL prescribed in GACAR § 117.23(b)(1)(2).
- 3) A method for reporting flight time extensions to the GACA as specified in GACAR § 117.11(b)(c)(d).
- 4) A statement in the certificate holder's operating manual that states flight time extensions may only be applied after takeoff, and only to the extent necessary to safely land at the next destination or alternate aerodrome, as appropriate.
- 5) Procedures for identifying and implementing corrective actions as specified in GACAR § 117.11(c) and (d).

**4.32.1.17. FLIGHT DUTY PERIOD.** An FDP is defined as a period that begins when a flight crew member is required to report for duty with the intention of conducting a flight, a series of flights, or positioning or ferrying flights, and ends when the aircraft is parked after the last flight and there is no intention for further aircraft movement by the same flight crew member. Additionally, an FDP includes the duties performed by the flight crew member on behalf of the certificate holder that occur before a flight segment, or between flight segments, without a required intervening rest period. Examples of tasks that are part of the flight duty period include deadhead transportation, training conducted in an aircraft or flight simulator, and aerodrome/standby reserve, if the above tasks occur before a flight segment or between flight segments without an intervening required rest period.

**A. Maximum FDP Limits.** One of the regulatory concepts of GACAR Part 117 is the restriction on flight crew members' maximum FDP limits. In creating maximum FDP limits, the rule addresses three primary fatigue concerns:

- 1) Flight crew members' circadian rhythms needed to be addressed because studies have shown that flight crew members who fly during their WOCL can experience severe performance degradation.
- 2) The amount of time spent at work needed to be taken into consideration because longer shifts increase fatigue.

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3) The number of flight segments in a duty period needed to be taken into account because flying more segments requires more takeoffs and landings, which are both the most task intensive and the most safety-critical stages of flight.

**B. Individual FDP Limits.** Under GACAR Part 117, a flight crew member is assigned an FDP limit based upon the scheduled time of start for that FDP. An FDP limit applies to the individual flight crew member, not the crew as a whole. Therefore, within a crew, each flight crew member could have a different maximum FDP limit. Flight crew member's FDP limits incrementally decrease the later in the day in which the schedule time of start occurs for both unaugmented and augmented operations. In addition:

1) Unaugmented Operations. Unaugmented flight crew member's maximum FDP limits will incrementally decrease as flight segments increase. These decrements mostly occur after the fourth segment, essentially representing a 30 minute decrement per segment. This decrease will continue to seven segments, where the limit remains consistent for each segment beyond seven segments. FDPs that have a Scheduled Time of Start between 0000-0359 have the shortest limit, which is nine hours, regardless of the number of segments flown.

2) Augmented Operations. An augmented flight crew member's maximum FDP limit will decrease with the use of a lower-class rest facility (i.e., Class 3 instead of a Class 2) along with the number of pilots assigned to that FDP.

**C. FDP Scheduled Time of Start.** The Scheduled Time of Start for an FDP is created once that FDP has been assigned to a flight crew member. In order to change this scheduled reporting time, the flight crew member would have to be shifted into either long-call or short-call reserve assignment for that pertinent FDP.

**D. Flight Crew Member's Start Time-Acclimated or Unacclimated Status.** Knowing the acclimation status of a flight crew member is essential in determining that flight crew member's maximum FDP limit. Regardless of whether the flight crew member is operating in an augmented or unaugmented operation, if the flight crew member is unacclimated, that flight crew member's maximum FDP limit must be reduced by 30 minutes. To determine the flight crew member's maximum FDP limit, he/she must enter the appropriate time under the header titled "Scheduled Time of Start." The time of start assumes the flight crew member is acclimated.

1) Acclimated Flight Crew Member. An acclimated flight crew member may use local time when entering Tables B or C of GACAR Part 117. The flight crew member may also use base

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time if acclimated to a theater that encompasses his or her home base. This essentially becomes the acclimation point (e.g., JFK time) the flight crew member will use for entering the appropriate table. Stated differently, the flight crew member will enter the appropriate table using the local time of the point where they are acclimated, or they may use the local time of their base, if their base is within the theater to which they are acclimated. For example, a flight crew member begins a series of FDPs in JFK, and is based in ORD, the flight crew member could use either JFK or ORD time. The certificate holder will determine and declare whether local or base time will be used; however, once determined and declared, the flight crew member will use that time (local or base) when entering the tables until that flight crew member receives 30 consecutive hours of rest (GACAR § 117.25(b)) or acclimates to a new theater. If the flight crew member's base is NOT in the theater to which the flight crew member is acclimated, the flight crew member must use the local time where the series of FDPs started. If, however, the flight crew member acclimates to a new theater, which requires 36 consecutive hours rest or 72 hours in the new theater, the point to which the flight crew member acclimates now becomes their new acclimation (or reference) point. The flight crew member is now considered acclimated to that point and will enter the tables based on the local time of that point.

2) Unacclimated Flight Crew Member. If a flight crew member is unacclimated, the flight crew member will enter Table B or C of GACAR Part 117 based on the local time where they were last acclimated. The flight crew member will remain unacclimated until he/she re-enters the theater to which he/she is acclimated, or receives 36 consecutive hours of rest, or remains in the new theater for 72 hours, which acclimates the flight crew member to a new theater.

**E. Determining FDP Limits.** A flight crew member's maximum FDP limit is determined by the use of either Table B of GACAR Part 117 for unaugmented operations (See Figure 4.32.1.2, Table B to Part 117 – Flight Duty Period: Unaugmented Operations) or Table C of Part 117 for augmented operations (See Figure 4.32.1.3, Table C to Part 117 – Flight Duty Period: Augmented Operations):

1) Unaugmented Operations. Determine if the flight crew member is acclimated or unacclimated. If the flight crew member is acclimated, the time entered will be based on the local time where the series of FDPs (or single FDP) started, or the flight crew member's base time. Base time may only be used if the flight crew member's base is in the theater to which he/she is acclimated. If the flight crew member is unacclimated, then the flight crew member will use the time at the point where he/she was last acclimated (the use of base time is not

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applicable). Enter Table B (Figure 4.32.1.2) under the header titled “Schedule Time of Start.” Identify the time started using the local or base time (as applicable) if acclimated, or the time at the point last acclimated for a flight crew member that is unacclimated. Under the header titled “Number of Flight Segments,” identify the number of segments to be flown (or actually flown). Extend vertically from that point until intersecting with the row that contains the time started. The point at which these data points intersect identifies the flight crew member’s maximum FDP limit. Increasing or decreasing the number of flight segments flown may result in a change to the flight crew member’s maximum FDP limit. However, for the purpose of determining the flight crew member’s maximum applicable FDP limit, a flight segment that results in a diversion is not counted to the limit. Additionally, a change in the “Scheduled Time of Start” range will impact the maximum FDP limit.

2) Augmented Operations. Determine if the flight crew member is acclimated or unacclimated. If the flight crew member is acclimated, the time entered will be based on the local time where the series of FDPs (or single FDP) started, or the flight crew member’s base time. Base time may only be used if the flight crew member’s base is in the theater to which he/she is acclimated. If the flight crew member is unacclimated, then the flight crew member will use the time at the point where he/she was last acclimated (the use of base time is not applicable.) Enter Table C (Figure 4.32.1.3) under the header titled “Schedule Time of Start.” Identify the time started using the local or base time (as applicable) if acclimated, or the time at the point last acclimated for a flight crew member that is unacclimated. Under the header titled, “Maximum flight duty period based on rest facility and number of pilots,” identify the class of rest facility being used, and then the number of pilots assigned to that FDP. Extend vertically from that point until intersecting the row containing the time scheduled to start. The point at which these data points intersect identifies the flight crew member’s maximum FDP limit. A change in the flight crew member’s maximum FDP limit will result if the number of pilots assigned, the class of rest facility used is changed, or the “Scheduled Time of Start” is outside the range for that timeframe.

3) Unacclimated Flight Crew Member. For either unaugmented or augmented operations, if the flight crew member is unacclimated, that flight crew member’s maximum FDP limit, as determined in Table B or C, must be reduced by 30 minutes.

**Figure 4.32.1.2. Table B to Part 117 – Flight Duty Period: Unaugmented Operations**

<b>Table B to Part 117 – Flight Duty Period: Unaugmented Operations</b>
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Scheduled time of start (acclimated time)	Maximum flight duty period (hours) for lineholders based on number of flight segments						
	1	2	3	4	5	6	7+
0000-0359	9	9	9	9	9	9	9
0400-0459	10	10	10	10	9	9	9
0500-0559	12	12	12	12	11.5	11	10.5
0600-0659	13	13	12	12	11.5	11	10.5
0700-1159	14	14	13	13	12.5	12	11.5
1200-1259	13	13	13	13	12.5	12	11.5
1300-1659	12	12	12	12	11.5	11	10.5
1700-2159	12	12	11	11	10	9	9
2200-2259	11	11	10	10	9	9	9
2300-2359	10	10	10	9	9	9	9

Figure 4.32.1.3. Table C to Part 117 – Flight Duty Period: Augmented Operations

Table C to Part 117 – Flight Duty Period: Augmented Operations						
Scheduled time of start (acclimated time)	Maximum flight duty period (hours) based on rest facility and number of pilots					
	Class 1 rest facility		Class 2 rest facility		Class 3 rest facility	
	3 pilots	4 pilots	3 pilots	4 pilots	3 pilots	4 pilots
0000-0559	15	17	14	15.5	13	13.5
0600-0659	16	18.5	15	16.5	14	14.5
0700-1259	17	19	16.5	18	15	15.5
1300-1659	16	18.5	15	16.5	14	14.5
1700-2359	15	17	14	15.5	13	13.5

**F. Demonstrating Compliance With GACAR §§ 117.13 and 117.17.** The certificate holder will be responsible for developing, implementing, and demonstrating the following:

- 1) A method for determining a flight crew member's maximum FDP limits for each flight crew member assigned to a flight.
- 2) Inserting a copy of Tables A, B, and C of GACAR Part 117 into their operating manual.
- 3) A process for determining when a flight crew member is acclimated and at what point he/she becomes unacclimated. This process should include a process for adjusting the flight crew member's maximum FDP limit.

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4) Policies and procedures for declaring whether the certificate holder will use local or base time. The policies and procedures should include methods for notifying the flight crew member of this declaration.

5) Policies and procedures for changing a flight crew member's assignment when the actual time of start of an FDP differs from the scheduled time of start, as assigned to the flight crew member.

**4.32.1.19. FLIGHT DUTY PERIOD EXTENSIONS (GACAR § 117.19).** GACAR Part 117 allows for the extension of a flight crew member's maximum FDP limit under specific conditions and limitations. GACAR § 117.19 provides for two conditions under which a flight crew member's FDP may be extended:

- A post takeoff FDP extension, and
- A pretakeoff FDP extension.

**A. Post takeoff FDP Extension.** The post takeoff FDP extension applies to an FDP in which a situation arises after takeoff that would cause a flight crew member to exceed the pertinent FDP limit. This type of extension is more generous than a pretakeoff FDP extension because once an airplane is in the air, the certificate holder and pilot in command (PIC) have very little discretion concerning FDPs and flight time limits, as they cannot change the flight crew while the plane is in the air.

**B. Pretakeoff FDP Extension.** For situations that are known before takeoff that would cause a flight crew member to exceed the pertinent FDP limit, only the more stringent pretakeoff FDP extensions can be utilized. That is because the certificate holder and PIC have more options for dealing with unexpected situations that arise while the plane is still on the ground. Thus, the distinction between pre- and post-takeoff FDP extensions comes from determining whether the flight crew member and certificate holder had a reasonable expectation before takeoff that the flight segment would be completed within the pertinent FDP limit.

**C. Construct of an FDP.** Tables B and C of GACAR Part 117 prescribe the maximum FDP limits. A 30-minute period exists at the end of each FDP, which may not be used for scheduling a flight crew member. The purpose for this 30-minute period is simply a buffer that may be used in the event the flight crew member's actual FDP runs over the maximum FDP limit by 30 minutes or less.

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**D. Applying a Pretakeoff FDP Extension.** If unforeseen operational circumstances arise prior to takeoff, a flight crew member's maximum FDP limit may be extended up to a maximum of 2 hours beyond their maximum FDP limit. Once a flight crew member's maximum FDP limit has been extended by more than 30 minutes, that flight crew member must receive a 30 consecutive hour rest period (as described in GACAR § 117.25(b)) before that flight crew member may accept another FDP extension exceeding 30 minutes. The following conditions and limitations apply to pretakeoff FDP extensions:

- 1) An FDP extension requires joint concurrence between the certificate holder and the PIC.
- 2) An FDP extension may be applied to either Table B (unaugmented) or Table C (augmented) FDP limits.
- 3) The maximum length of an FDP extension is 2 hours. However, a flight crew member may accept an FDP extension that is more than 30 minutes but less than the maximum 2-hour limit.
- 4) A pretakeoff FDP extension cannot be utilized if it causes a flight crew member to exceed the cumulative FDP limits specified in GACAR § 117.23(c).
- 5) A flight crew member cannot accept another FDP extension exceeding 30 minutes until that flight crew member has received a 30 consecutive hour rest period, as prescribed in GACAR § 117.25(b).

**E. Reporting Pretakeoff FDP Extensions.** Each certificate holder must, within 10 days, report to the GACA any FDP that exceeded the maximum FDP permitted in Tables B or C by more than 30 minutes. The report must contain the following:

- 1) A description of the extended FDP and the circumstances surrounding the need for the extension;
- 2) If the circumstances giving rise to the extension were within the certificate holder's control, the corrective action(s) that the certificate holder intends to take to minimize the need for future extensions; and
- 3) The certificate holder must implement the corrective action(s) identified in this report within 30 days from the date of the extended FDP.

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**F. Applying a Post takeoff FDP Extension.** If unforeseen operational circumstances arise after takeoff, the PIC and the certificate holder may extend a flight crew member's maximum FDP limits specified in Tables B or C of GACAR Part 117 to the extent necessary to safely land the aircraft at the next destination aerodrome or alternate aerodrome, as appropriate. The following conditions and limitations apply to post takeoff FDP extensions:

- 1) FDP extension may be applied to either Table B (unaugmented) or Table C (augmented) FDP limits.
- 2) An extension of a flight crew member's maximum FDP limit by more than 30 minutes may occur only once prior to receiving a 30 consecutive hour rest period described in GACAR § 117.25(b).
- 3) A post takeoff FDP extension may exceed the cumulative FDP limits specified in GACAR § 117.23(c).
- 4) The certificate holder must report to the FAA within 10 days any FDP that exceeded the maximum FDP limits permitted by Tables B or C of GACAR Part 117.
- 5) The report must contain a description of the circumstances surrounding the affected FDP.

**G. Operational and Regulatory Considerations.** FDP limits are applicable to a single flight crew member, not the crew. Under GACAR § 117.19(a)(2) and (b)(2), an FDP extension of a flight crew member's maximum FDP limit that is greater than 30 minutes can only be taken once before that flight crew member is provided with 30 consecutive hours of rest, as prescribed in GACAR § 117.25(b). Therefore, if a flight crew member had their maximum FDP limit extended beyond the 30 minutes, that flight crew member could not take another FDP extension until receiving the 30 consecutive hour rest period reset. Thus, that flight crew member and the certificate holder would be in violation of GACAR Part 117 if that flight crew member exceeds the pertinent FDP limits by more than 30 minutes. It is irrelevant that the FDP limit exceedance would have been caused by unforeseen operational circumstances. To that end, once a flight crew member uses an FDP extension, the GACA strongly recommends that the certificate holder add buffers to that crewmember's schedule to account for possible unexpected events, reassign that flight crew member, or provide that crewmember with a 30-hour rest period as soon as possible in order to reset the flight crew member for an FDP extension.

**H. Evidence of FDP Extension Concurrence.** A record of PIC concurrence can take any

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reasonable form as long as there is evidence that the PIC concurred with the extension. For example, the PIC could note his/her concurrence with an FDP extension on a dispatch/flight release or in an ACARS message.

**I. FDP Extensions Less Than 2 Hours.** If the PIC believes that the flight crew is too fatigued for a two-hour FDP extension, the PIC could concur to a shorter FDP extension that he/she believes could safely be carried out by the flight crew. Additionally, pursuant to GACAR § 117.5, each flight crew member would also have to certify that he/she would not be too fatigued to operate the aircraft during the extension.

**J. FDP Extensions That Exceed Cumulative Limits.** Under GACAR § 117.19(b)(3), a post takeoff FDP extension allows a flight crew member to exceed the cumulative FDP limits. However, a post takeoff FDP extension is limited in that it expires once the airplane lands. Once the flight on which the post takeoff extension was used has been completed, the flight crew member would again be bound by the cumulative FDP limitations. Thus, the post takeoff FDP extension allows a flight crew member to exceed the cumulative FDP limits only to the extent necessary to complete the flight on which the extension is utilized.

**K. Submitting FDP Extension Reports.** The certificate holder will submit all FDP extension reports, circumstances for the extension, and corrective actions, as necessary, to the principal operations inspector.

**L. Demonstrating Compliance With GACAR § 117.19.** The certificate holder will be responsible for developing, implementing and demonstrating the following:

- 1) Procedures for the certificate holder and the PIC to follow when extending an FDP.
- 2) Outline the limits of the FDP extension, as specified in GACAR § 117.19.
- 3) Method for archiving PIC concurrences after accepting an FDP extension.
- 4) Procedures for ensuring the flight crew member receives a 30 consecutive hour rest period, as specified in GACAR § 117.25(b), prior to accepting another FDP extension.
- 5) Statement in the certificate holder's operating manual that when a pretakeoff extension of an FDP is applied, the FDP cumulative limitations specified in GACAR § 117.23(c) may not be exceeded.

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- 6) Detailed procedures for reporting FDP procedures, determining the root-cause, and developing and implementing the necessary corrective actions.
- 7) Policy statement that post takeoff extensions may only be used to the extent necessary to safely land the aircraft at the next destination or alternate aerodrome, as appropriate.

**4.32.1.21. REST FACILITIES.** Rest is the best form of fatigue mitigation based upon the quality of rest received. Onboard flight crew member rest facilities are designed to provide one of three qualities of rest: good, fair, or poor. GACAR Part 117 defines and classifies onboard flight crew member rest facility criteria. As defined in GACAR Part 117, a rest facility means bunk or seat accommodation installed in an aircraft that provides a flight crew member with a sleep opportunity.

**A. Classification of Rest Facilities.** Rest facilities are classified into three categories: Class 1, Class 2 or Class 3. An essential factor in determining an augmented flight crew member's maximum FDP limit is the classification of rest facility being used. A Class 1 rest facility provides the best quality of rest, therefore provides a longer FDP limit than a Class 3 rest facility, which provides the least quality of the three classes. For this reason a rest facility must be qualified as meeting one of the following criteria:

- 1) Class 1 rest facility means a bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature controlled, allows the flight crew member to control light, and provides isolation from noise and disturbance.
- 2) Class 2 rest facility means a seat in an aircraft cabin that allows for a flat or near flat sleeping position; is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation; and is reasonably free from disturbance by passengers or flight crew members.
- 3) Class 3 rest facility means a seat in an aircraft cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.

**B. Operations Specifications (OpSpec) A117.** When a certificate holder conducts augmented flight crew operations, the certificate holder must have OpSpec A117 issued identifying the aircraft and classification of rest facility used in augmented flight crew operations. OpSpec A117 identifies aircraft with onboard rest facilities by the registration and serial number, make, model, and series (M/M/S), the classification of rest facility and the number of sleep surfaces installed

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under that classification. OpSpec A117 provides the certificate holder, flight crew member and inspector with the necessary information to determine the applicable FDP limits for an augmented flight crew member.

**C. Significance of Rest Facility Classification.** Each rest facility has a classification ranking from one through three that defines the maximum flight duty period (FDP) limits predicated on the flight crew member's start time, the number of pilots and the classification of rest facility to be used for augmented flight crew operations. A Class 1 facility provides for the longest FDP, a Class 2 provides for the second longest FDP, and a Class 3 provides for the third longest FDP.

**D. Specific Guidance for Qualifying Rest Facilities.** The current edition of FAA AC 117-1, Flightcrew Member Rest Facilities, provides guidance on qualifying rest facilities and the issuance of OpSpec A117.

**E. Additional References.** More information on rest facilities may be found in:

- FAA AC 117-1, Flightcrew Member Rest Facilities

### 4.32.1.23. AUGMENTATION.

**A. Use of Augmentation.** Augmentation enables the certificate holder to use longer FDP limits by: (1) using rest facilities; and (2) increasing the number of flight crew members assigned to a flight, above the minimum required flight crew member complement. As a result, each flight crew member is able to receive in-flight rest and the workload is shared among 3 or 4 flight crew members, as opposed to 2 flight crew members, thereby, reducing the effects of fatigue. Augmented flight crew member operations also enable higher flight time limits based upon either a 3- or 4-pilot operation. When augmented flight crew member operations are used, the aircraft assigned to that flight must have an installed rest facility that meets the criteria of a Class 1, 2, or 3 rest facility, and that aircraft information must be reflected in OpSpec A117.

1) When is Augmentation Required? Augmentation is required whenever a pilot is scheduled to fly in excess of the flight time limits prescribed in Table A of GACAR Part 117, when three or more pilots are assigned to the flight, or when the flight crew member FDP limit is based on the limits of Table C of GACAR Part 117. When augmentation is applied, the airplane must have an installed rest facility that is qualified as meeting one of the three classifications defined in GACAR § 117.3.

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- 2) Augmented FDP Limits. Table C of GACAR Part 117 prescribes the maximum FDP limits for a flight crew member based upon the scheduled time of start of the FDP, the class of rest facility used and the number of flight crew members assigned to that flight or series of flights (see Figure 3-163).
- 3) Augmented Flight Crew Member Flight Time Limits. Flight time limits for augmented flight crew member FDPs consisting of 3 or 4 pilots are prescribed in GACAR § 117.11(a) (2)(3), which are 13 hours for 3 pilots and 17 hours for 4 pilots.
- 4) Constrained FDPs. FDP limits are reduced consistently based upon the schedule time of start of the FDP, the number of pilots assigned to the flight (or series of flights), and the class of rest facility used. While the maximum flight time limit for 4 pilots is 17 hours, the FDP limits for 4 pilots using a Class 3 rest facility constrains the maximum flight time limit to a lower limit. With exception of an FDP start time between 0700 and 1259, the FDP limits using a Class 2 rest facility also constrain the flight time limits for 4 pilots below the maximum flight time limit.
- 5) Benefits of Augmentation. The main benefit for augmentation is fatigue mitigation. However, due to operational necessity, if the certificate holder required a higher FDP or flight time limit for a flight or series of flights above the unaugmented limits, the use of augmentation may achieve the certificate holder's needs. If augmentation were used, the maximum applicable augmented FDP limits based upon the FDP start time, number of pilots assigned, and rest facility used would apply, along with the applicable flight time limit for either a 3- or 4-pilot assignment, keeping in mind the FDP limit may constrain the maximum flight time limit.
- 6) Limits on Augmentation. A flight crew member is limited to a maximum of three segments while conducting an augmented FDP.
- 7) Limitations on a Diversion. A flight segment contains a takeoff and landing. If a takeoff results in a diversion, that flight segment (segment containing the diversion) will not be treated as a segment for the purpose of calculating the maximum 3-segment limitation for augmented FDP. While a diversion may not count as a flight segment, the time spent on diversion would still count for purposes of the FDP and flight time limits. This is because the flight-time limit applies to all time that is spent piloting an aircraft and the FDP limit applies to all time between when a pilot first reports for duty with the intention of flying a

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plane and when the pilot completes his/her final flight segment. Likewise, when determining the flight crew member's maximum applicable FDP limit for unaugmented operations, a flight segment that results in a diversion is not considered part of the total segments during that FDP.

**B. Conditions and Limitations on the Landing and Monitoring Flight Crew Members.** The following conditions and limitations apply to the landing and monitoring flight crew members operating on an augmented FDP:

- 1) Two consecutive-hours in the second half of the flight duty period are available for in-flight rest for the pilot flying the aircraft during landing.
- 2) Ninety consecutive-minutes are available for in-flight rest for the pilot performing monitoring duties during landing.

**C. Cumulative Flight Duty Period Limits.** Cumulative flight duty period hours are limited to any 168 consecutive-hours (seven consecutive-day-period) or any 672 consecutive hours (four consecutive-week-period). No certificate holder may schedule and no flight crew member may accept an assignment if the flight crew member's total FDP hours will exceed:

- 60 FDP-hours in any 168 consecutive-hours, or
- 190 FDP-hours in any 672 consecutive-hours.

**4.32.1.25. FLIGHT DUTY PERIOD: SPLIT-DUTY (GACAR § 117.15).** The GACA defines the term "split-duty" as a FDP having a scheduled break in duty that is less than a required rest period. However, the scheduled break in duty does not provide the flight crew member with a minimum of 10 consecutive-hours of rest required prior to beginning an FDP or reserve period. Split-duty is an effective fatigue mitigation that is based on the premise that there are times during an unaugmented nighttime FDP when a certificate holder could reasonably provide a flight crew member with an opportunity for rest. This rest opportunity (opportunity to sleep) would allow a flight crew member to get some sleep during the night. The nighttime sleep could be used to mitigate the performance degradation created by working through the WOCL.

**A. Minimum Split-Duty Rest.** Split-duty rest breaks provide carriers conducting nighttime operations with additional flexibility. Split-duty rest must be at least 3 hours long and must be scheduled in advance. The actual split-duty rest breaks may not be shorter than the scheduled split-duty rest breaks. The rationale for this is that flight crew members must, at the beginning of

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their FDP, evaluate their ability to safely complete their entire assigned FDP. In order to do so, they must not only know the length of the FDP, but any scheduled split-duty rest breaks that they will receive during their FDP.

**B. Unaugment Operations Only.** Split-duty may only be applied to an unaugmented flight crew member; therefore, an augmented flight crew may not receive any split-duty rest credit under the provisions prescribed in GACAR § 117.15.

**C. Suitable Accommodation.** The split-duty rest must occur in a suitable accommodation during his or her FDP. The time that the flight crew member spends in the suitable accommodation is not considered part of that flight crew member's FDP if all of the following conditions are met:

- 1) The rest opportunity is provided between the hours of 2200 and 0500 local time.
- 2) The time spent in the suitable accommodation is at least 3 hours, measured from the time that the flight crew member reaches the suitable accommodation.
- 3) The rest opportunity is scheduled before the beginning of the flight crew member's FDP in which that rest opportunity is taken.
- 4) The rest opportunity that the flight crew member is actually provided may not be less than the rest opportunity that was scheduled.
- 5) The split-duty rest opportunity may not be provided until the flight crew member's first segment of that FDP has been completed.
- 6) The combined time of the FDP and the split-duty rest opportunity may not exceed 14 hours.

NOTE: If the combined split-duty rest opportunity and FDP time of a flight crew member exceeds 14 hours, then the amount of split-duty rest that caused the exceedance would not count as split-duty. Instead, this time would simply count as part of the flight crew member's FDP, and it would be subject to the FDP extensions specified in GACAR § 117.19.

**D. Scheduled vs. Actual Split-Duty Rest Break.** GACAR § 117.15(d) states that the actual split-duty rest opportunity may not be less than the scheduled split-duty rest opportunity. However, GACAR § 117.15 does not prohibit actual split-duty rest from exceeding the

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scheduled split duty rest. If the actual split-duty rest period exceeds the scheduled rest period, then the actual rest provided to the flight crew member would be considered split-duty as long as that rest period is within the 14-hour limit specified in GACAR § 117.15(f).

**E. Application of Local Time for Split-Duty Rest.** GACAR § 117.15(a) states that the split-duty rest opportunity must be “provided between the hours of 2200 and 0500 local time.” Thus, in order to determine compliance with GACAR § 117.15(a), the certificate holder must use local time at the location where the split-duty rest is being provided regardless of whether the flight crew member is acclimated to the theater that encompasses that location.

### 4.32.1.27. RESERVE STATUS (GACAR § 117.21).

**A. Reserve Flight Crew Member.** A reserve flight crew member is a flight crew member who a certificate holder requires to be available to receive an assignment for duty.

**B. Reserve Status.** A flight crew member assigned to a reserve period is considered to be in one of the following three reserve classifications (Status):

- 1) Airport/standby,
- 2) Short-call, or
- 3) Long-call.

**C. Reserve Limitations.** Unless the certificate holder specifically designates a flight crew member assigned to a reserve period as being aerodrome/standby or short-call reserve, then that flight crew member is considered to be on long-call reserve; and must comply with the provisions prescribed for this classification of reserve.

**D. Airport/Standy Reserve.** Any reserve that meets the definition of aerodrome/standby reserve must be designated as aerodrome/standby reserve. The definition of aerodrome/standby reserve may be found in GACAR § 117.3. For aerodrome/standby reserve, all time that is spent on aerodrome/standby reserve is part of a flight crew member’s FDP regardless of what happens during the aerodrome/standby reserve. Therefore, the flight crew member must be assigned in accordance with the applicable FDP limitations prescribed in Tables B or C (as applicable) of GACAR Part 117.

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**E. Cumulative Limitations.** Since all time spent in an aerodrome/standby reserve status is part of the flight crew member's FDP time, that time spent on Airport/standby is subject to the cumulative FDP limitations specified in GACAR § 117.21(b).

**F. Physical Location of an Aerodrome/Standby Assignment.** GACAR § 117.3 defines aerodrome/standby reserve as a duty period during which a flight crew member is required by a certificate holder to be at an aerodrome for a possible assignment. In order to be at an aerodrome, a flight crew member would have to be physically located on aerodrome property.

**G. Short-Call Reserve.** A flight crew member assigned to short-call will have a reserve availability period (RAP) identifying the timeframe in which that flight crew member must be available to the certificate holder. The flight crew member's RAP may not exceed 14 hours.

**H. Short-Call Rest Limitations.** Once a flight crew member completes a RAP, the flight crew member must receive the required rest specified in GACAR § 117.25(e) prior to the certificate holder scheduling, and the flight crew member accepting, an assignment for another RAP.

**I. FDP and RAP Limitations for Unaugmented Operations.** The total number of hours a flight crew member may spend in an FDP and a RAP may not exceed the lesser of the maximum applicable FDP limit in Table B of GACAR Part 117 plus 4 hours, or 16 hours, as measured from the beginning of the RAP. Essentially, the combined number of hours spent in a RAP and FDP may not exceed the lesser of: pertinent FDP limit in Table B plus four hours or 16 hours.

**J. FDP Limits and the Addition/Subtraction of Flight Segments for Unaugmented Operations.** The number of flight segments in an FDP can be changed after an FDP begins. However, as flight segments are added to a flight crew member's FDP, the potential outcome may be a decreased FDP limit. Conversely, if the number of flight segments in an FDP is reduced, the FDP limit may be slightly increased up to the maximum limit. For the purposes of determining maximum applicable FDP limits, in the event a flight segment results in a diversion, the diversion segment does not count as a segment.

**K. FDP and RAP Limitations for Augmented Operations.** The total number of hours a flight crew member may spend in an FDP and a RAP may not exceed the maximum applicable FDP limit in Table C of GACAR Part 117 plus 4 hours, as measured from the beginning of the RAP. The combined number of hours spent in a RAP and an FDP may not exceed the pertinent FDP limit in Table C plus 4 hours.

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**L. FDP and RAP Limitations Apply to the Individual Flight Crew Member.** The RAP and RAP + FDP limits, as well as the other limits in GACAR § 117.21, apply to each flight crew member individually.

**M. Example for Applying FDP and RAP Limits (Unaugmented Operations).** An acclimated flight crew member begins a RAP at 0600. That flight crew member is then assigned to an unaugmented FDP that begins at 1200 and consists of two flight segments. According to Table B, the FDP limit for a two-segment FDP that begins at 1200 is 13 hours. The applicable 13-hour FDP limit plus 4 hours equals 17 hours. Because this is greater than 16 hours, under GACAR § 117.21(c)(3), the pertinent RAP + FDP limit for this unaugmented operation is 16 hours. Given that the flight crew member in this example began his RAP at 0600, he will have 6 hours of RAP time by the time his FDP will start at 1200. As a result, to stay within the 16-hour RAP + FDP limit, this flight crew member's FDP cannot exceed 10 hours without an extension, as his RAP will use up 6 hours of the 16-hour RAP + FDP limit. For the second example, an acclimated flight crew member begins a RAP at 1100. That flight crew member is then assigned to an unaugmented FDP consisting of five flight segments that begin at 1500. According to Table B, the FDP limit for a five-segment FDP that begins at 1500 is 11.5 hours. The applicable 11.5-hour FDP limit plus 4 hours equals 15.5 hours. Because this is smaller than 16 hours, under GACAR § 117.21(c)(3), the pertinent FDP + RAP limit for this unaugmented operation is 15.5 hours. Since the flight crew member in this example began his RAP at 1100, he will have 4 hours of RAP time by the time his FDP will start at 1500. Consequently, this flight crew member can take the full 11.5-hour FDP as the 11.5-hour FDP plus the 4 hours of RAP will not exceed the 15.5 hour RAP + FDP limit.

**N. Entering the FDP Table While on a RAP.** The pertinent FDP limit for the RAP + FDP regulations in GACAR § 117.21 is determined using the time at which the FDP begins.

**O. Reserve and Cumulative Limitations.** Short-call reserve consists of a RAP and an FDP, if the FDP is assigned during the reserve. The RAP is not part of an FDP, and as such, the time spent on an FDP is the only aspect of short-call reserve that is counted toward the cumulative FDP limits. However, this situation would change if the pilot was to be assigned to aerodrome/standby reserve instead of short-call reserve. Under GACAR § 117.21(b), the entire time that is spent in aerodrome/standby reserve is considered to be FDP.

**P. Long-Call Reserve Rest Requirements.** A flight crew member assigned to long-call reserve must receive the rest specified in GACAR § 117.25(e). However, if a certificate holder contacts a

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flight crew member to assign him to an FDP that will begin before and operate into the flight crew member's WOCL, the flight crew member must receive a 12-hour notice of report time from the certificate holder.

**Q. Shifting a Flight Crew Member from Long-Call to Short-Call Reserve.** A certificate holder may shift a reserve flight crew member's reserve status from long-call to short call only if the flight crew member receives a rest period as provided in GACAR § 117.25(e).

**4.32.1.29. REST PERIODS (GACAR § 117.25).** A certificate holder may not assign, nor may a flight crew member accept, an assignment to any reserve or duty with that certificate holder during any required rest period. A rest period must be prospective in nature, which means that a flight crew member must be told in advance that he or she will be on a rest period for a specified duration. This is so that a flight crew member has an opportunity to plan out his or her rest period in order to maximize the sleep opportunities available during that rest period.

**A. Minimum 10-Hour Rest Period.** GACAR Part 117 prescribes the minimum rest period between FDPs as 10 consecutive hours measured from the time the flight crew member is released from duty. This 10-hour rest period must provide the flight crew member with a minimum 8 uninterrupted hours of sleep opportunity. GACAR § 117.25(e) requires the 10 hours of rest period (that includes an 8-hour uninterrupted sleep opportunity) to occur immediately before the flight crew member begins a reserve period or FDP. This is to ensure the flight crew member is properly rested prior to accepting an assignment for reserve or an FDP. If, however, the flight crew member determines that their 10-hour rest period will not provide 8 uninterrupted hours of sleep opportunity, the flight crew member must notify the certificate holder. The flight crew member cannot report for the assigned reserve period or FDP until that flight crew member receives an 8-hour sleep opportunity.

**B. Thirty-Hour Cumulative Rest Period.** In an effort to mitigate cumulative fatigue, a flight crew member must receive a 30 consecutive hour rest period within the previous 168 consecutive hours. Therefore, before beginning any reserve or FDP, a flight crew member must be given at least 30 consecutive hours free from all duty in any 168 consecutive hours. The point of reference for the 168-hour rest period specified in GACAR § 117.25(b) is the beginning of an FDP. In this case GACAR § 117.25(b) requires that a flight crew member be provided with a 30 consecutive hour rest period in the 168-hour period immediately preceding an FDP. In the event a flight crew member has received 36 consecutive hours of rest to re-acclimate to a new theater, the flight crew member is considered to have met the 30 consecutive hour cumulative rest requirement. Again,

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the flight crew member's assigned rest period must be prospective in nature. Because a flight crew member would need to plan ahead in order to maximize the multiple sleep opportunities available during this 30-hour rest period, the flight crew member must be told before the rest period begins that he/she will be receiving 30 hours of rest in order for that rest to satisfy GACAR § 117.25(b).

**C. Acclimation.** A flight crew member operating in a new theater that has received 36 consecutive hours of rest, or who has been in a new theater for 72 hours, is considered to be acclimated to that new theater.

**D. Rest Requirements After Being Out of Theater and Away From Home Base for More Than 168 Hours.** If a flight crew member travels more than 60° longitude during an FDP, or a series of FDPS, that require him or her to be away from home base for more than 168 consecutive hours, the flight crew member must be given a minimum of 56 consecutive hours rest upon return to home base. This required rest must encompass three physiological nights' rest based on local time.

**E. Rest Requirements for Deadhead Transportation.** If a flight crew member engaged in deadhead transportation exceeds the applicable FDP in Table B of GACAR Part 117, the flight crew member must be given a rest period equal to the length of the deadhead transportation but not less than 10 consecutive hours immediately before beginning an FDP measured from the time the flight crew member is released from duty. For the purpose of clarity, in accordance with the definition of FDP in GACAR § 117.3, deadhead transportation that is followed by a flight segment without an intervening rest period is part of an FDP and is subject to the FDP limits in Tables B and C. All other deadhead transportation is not part of an FDP and is not subject to any limits under GACAR Part 117. However, if the deadhead transportation exceeds the limits of Table B, GACAR § 117.25(g) requires that the flight crew member engaging in the deadhead transportation be provided with a compensatory rest period before beginning his/her next FDP.

**4.32.1.31. CONSECUTIVE NIGHTTIME OPERATIONS (GACAR § 117.27).** The provisions prescribed in GACAR § 117.27 for consecutive nighttime operations apply whenever a flight crew member's FDP infringes on any part of that flight crew member's WOCL. If, however, a flight crew member's FDP remains entirely free of their WOCL, the provisions of GACAR § 117.27 would not be applicable. When a flight crew member conducts operations during their WOCL, the risk of cumulative fatigue significantly increases. For this reason GACAR § 117.27 prescribes specific limitations and conditions when consecutive nighttime operations apply, regardless of whether the

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FDP is unaugmented or augmented.

**A. Limitations for Consecutive Nighttime Operations.** Flight crew members are limited to a maximum of 3 consecutive nighttime FDPs without any additional mitigation. However, a flight crew member may be assigned a maximum of 5 consecutive nighttime FDPs provided the certificate holder provides that flight crew member with a minimum 2-hour mid duty rest opportunity during each of the 5 consecutive nighttime FDPs. This rest period must be taken in a suitable accommodation (as defined in GACAR § 117.3), and the minimum 2-hour mid duty rest opportunity is measured from the time that flight crew member reaches the suitable accommodation.

**B. Infringement on the Flight Crew Member's WOCL.** As a point of reference, in a series of consecutive FDPs, the flight crew member's first FDP that infringes on their WOCL is subject to the limitations prescribed in consecutive nighttime operations. A flight crew member may not exceed three consecutive nighttime operations without specific mitigations prescribed in GACAR § 117.27. This simply means that a flight crew member may not be scheduled, or accept an assignment, for more than three consecutive nighttime FDPs where each of the three FDPs infringe on any part of that flight crew member's WOCL.

**C. Limitations on Five Consecutive Nighttime FDPs.** A certificate holder may schedule, and a flight crew member may accept, up to five consecutive FDPs if that certificate holder provides that flight crew member with an opportunity to rest in a suitable accommodation during each of the consecutive nighttime FDPs. The criteria for the suitable accommodation must meet the definition outlined in GACAR § 117.3. Principally, a flight crew member may be scheduled and may accept up to 5 consecutive nighttime operations provided the certificate holder provides that flight crew member with a minimum of a 2-hour rest opportunity during each of the consecutive nighttime FDPs. When a flight crew member is scheduled 4 or 5 consecutive nighttime FDPs, that flight crew member must be provided at least a 2-hour rest opportunity during each of the 4 or 5 FDPs, as applicable. Otherwise, that flight crew member is limited to three consecutive nighttime FDPs.

**D. Two-Hour Rest Opportunity Conditions and Limitations.** The minimum 2-hour rest opportunity is measured from the time that flight crew member reaches the suitable accommodation. The following limitations and conditions shall apply to each 2-hour mid-duty rest opportunity:

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- 1) The rest opportunity is provided between the hours of 2200 and 0500 local time.
- 2) The rest opportunity is scheduled before the beginning of the FDP in which that rest opportunity is taken.
- 3) The rest opportunity that the flight crew member is actually provided may not be less than the rest opportunity that was scheduled.
- 4) The rest opportunity is not provided until the first flight segment of the FDP has been completed.

### **4.32.1.33. EMERGENCY AND GOVERNMENT-SPONSORED OPERATIONS (GACAR § 117.29).**

Flights operated by a certificate holder under contract with a KSA Government agency must comply with the flight and duty regulations in GACAR Part 121 and Part 135, as appropriate, unless the President has granted relief under GACAR §§ 119.105 or 119.107. This section addresses various supplemental operations that require flying into or out of hostile areas, and politically sensitive, remote areas that do not have rest facilities. This authority is issued on a case-by-case basis during an emergency situation as determined by the President.

**A. Application of Emergency and Government-Sponsored Operations.** The purpose of this section is to address true emergency situations and operations that are being conducted under contract with the KSA Government that pose exceptional circumstances that would otherwise prevent a flight crew member from being relieved from duty or safely provided with rest at the end of the FDP. This section is not meant to address self-induced emergencies that arise from inadequate planning. Certificate holders must be responsible for having appropriate onboard rest facilities or the proper number of flight crew members available for the length of the duty day, if necessary.

**B. PIC Limited Authority to Extend an FDP.** The PIC may determine that maximum applicable FDPs must be exceeded to the extent necessary to allow the flight crew to fly to the closest destination where they can safely be relieved from duty by another flight crew or can receive the requisite amount of rest prior to commencing their next FDP.

**C. Prohibition on Exceeding Cumulative Limitations.** An FDP may not be extended for an operation conducted pursuant to a contract with the KSA Government if it causes a flight crew member to exceed the cumulative flight time limits in GACAR § 117.23(b) and the cumulative FDP limits in GACAR § 117.23(c).

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**D. Required Rest.** The flight crew shall be given a rest period immediately after reaching the destination equal to the length of the actual FDP or 24 hours, whichever is less.

**E. Reporting FDP Extensions Under This Section.** Each certificate holder must report to the FAA within 10 days:

- 1) Any FDP that exceeded the maximum FDP permitted in Tables B or C of GACAR Part 117, as applicable, by more than 30 minutes; and
- 2) Any flight time that exceeded the maximum flight time limits permitted in Table A of GACAR Part 117 and GACAR § 117.11, as applicable.

**F. Contents of the FDP Extension Report.** The report must contain the following:

- 1) A description of the extended FDP and flight time limitation, and the circumstances surrounding the need for the extension; and
- 2) If the circumstances giving rise to the extension(s) were within the certificate holder's control, the corrective action(s) that the certificate holder intends to take to minimize the need for future extensions.

**G. Implementation of Corrective Actions.** Each certificate holder must implement the corrective action(s) reported in the FDP extension report within 30 days from the date of the extended FDP.

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#### **CHAPTER 32. MANAGEMENT OF AVIATION FATIGUE**

##### **Section 2. Evaluation and Qualification of Onboard Flight Crew Member Rest Facilities for Part 117 Operations**

**4.32.2.1. GENERAL.** This section provides the aviation safety inspector (Inspector) with the necessary guidance to evaluate and qualify a certificate holder's onboard flight crew member rest facilities as meeting the specifications and criteria of a Class 1, 2, or 3 facility.

**4.32.2.3. BACKGROUND.** GACAR Part 117 prescribes many limitations supporting fatigue mitigation that are based on current fatigue science. GACAR Part 117 established three classes of onboard flight crew member rest facilities. The minimum criteria required for a rest facility to be qualified as meeting either a Class 1, 2, or 3 designation is defined in GACAR § 117.3 and outlined in FAA AC 117-1, Flightcrew Member Rest Facilities.

**A. Qualification.** Qualification of an onboard rest facility is an essential function for determining whether a particular rest facility meets the criteria of one of the three classes. Once the GACA qualifies that rest facility as meeting one of the three classifications prescribed in GACAR Part 117, the classification for that specific airplane will remain in effect until the rest facility is modified or the GACA determines it no longer meets its previously qualified status. Ensuring that a rest facility meets and is maintained to its qualified classification is crucial as the class of rest facility used is one of the three elements required to determine a flight crew member's maximum flight duty period (FDP) limit for augmented operations.

##### **4.32.2.5. DIFFERENCES BETWEEN A REST FACILITY AND A SUITABLE ACCOMMODATION.**

**ACCOMMODATION.** In an effort to eliminate confusion between the terms rest facility and a suitable accommodation, GACAR Part 117 defines a rest facility as a bunk or seat accommodation installed in an airplane that provides a flight crew member with sleep opportunity.

**A. Suitable Accommodation.** A suitable accommodation means a temperature-controlled facility with sound mitigation, the ability to control light and provides a flight crew member with the ability to sleep either in a bed, bunk, or in a chair that allows for a flat or near flat sleeping position. Suitable accommodation only applies to ground facilities and does not apply to airplane onboard rest facilities.

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**B. Classification of Rest Facilities.** Each classification of a rest facility is designed to provide a minimum sleep quality based upon its classification. A Class 1 facility provides good sleep, a Class 2 provides fair sleep, and a Class 3 provides poor sleep quality. The better the quality of sleep the longer the flight crew member's maximum FDP limit. Conversely, the lesser the sleep quality, the shorter the flight crew member's FDP limit. GACAR § 117.3 defines the classification of each onboard flight crew member rest facility based upon the following physical characteristics, specifications, and design criteria:

- 1) Class 1 rest facility means a bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled, allows the flight crew member to control light, and provides isolation from noise and disturbance.
- 2) Class 2 rest facility means a seat in an airplane cabin that allows for a flat or near flat sleeping position, is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation, and is reasonably free from disturbance by passengers or flight crew members.
- 3) Class 3 rest facility means a seat in an airplane cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.

### 4.32.2.7. FDP LIMITS.

**A. Relationship Between Rest Facility Qualification and Augmented FDP Limits.** The FDP limits for augmented operations may be found in Table C of GACAR Part 117.

**B. Difference Between Maximum FDP Limits and Maximum Applicable FDP Limits.** FDP limits apply to the individual flight crew member. For the purpose of augmented flight crew member operations, Table C of GACAR Part 117 prescribes a flight crew member's maximum FDP limits based upon the class of rest facility used, the number of pilots assigned, and the flight crew member's scheduled time of start. The table assumes the flight crew member is acclimated; however, if the flight crew member is not acclimated their maximum FDP limit must be reduced by 30 minutes. The term "maximum applicable FDP limit" illustrates the flight crew member's maximum FDP limits based upon the class of rest facility, number of pilots assigned, scheduled time of start and whether the flight crew member is acclimated.

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### **4.32.2.9. REST FACILITIES.**

**A. Physical Location of the Rest Facility.** The certificate holder must consider many factors when determining the location of an onboard rest facility. Such factors include isolation from disturbance by passengers and other crewmembers, environmental noise, and the location of the rest facility with respect to the serving carts and around the galley areas. Rest facilities should not be located in the economy-class section of the airplane. One of the reasons why an economy-class seat does not provide restful sleep is that space around the seat is not sufficient to create an adequate separation from the passengers (economy jostling). Because there are substantially more passengers in the economy section of an airplane, that section is generally noisier and have more densely-packed people than the other sections of the airplane. In addition, the GACA notes that economy cabins are generally located behind the airplane engines, and thus, have to deal with louder engine noise. Due to all of these considerations, locating a rest facility in the economy section would reduce the restfulness of the sleep obtained by a flight crew member.

**B. Prohibition on the Use of an Economy-Class Passenger Seat as a Rest Facility.** The decision to not consider an economy-class seat as a rest facility was based on research which determined that “the probability of obtaining recuperative sleep in such a seat would be minimal” on the following considerations:

- 1) An economy-class seat does not recline more than 40 degrees “and has no opportunities for adequate foot and leg rest, which diminishes the probability of recuperative sleep,”
- 2) “Space around the seat is not sufficient to create an adequate separation from the passengers (jostle in economy class), or guarantee any privacy,” and
- 3) “A majority of passengers are unable to sleep at all in an economy seat.”

**C. Relationship Between Rest Facility and Sleep Surface.** A sleep surface is the fundamental part of the rest facility and may be a bed, bunk, or a seat based upon the classification of rest facility. Each class of rest facility has physical specifications relative to that specific classification.

**D. When a Rest Facility is Required.** A rest facility is required any time the flight crew is augmented. The rest facility used must meet one of the three classifications outlined in GACAR § 117.3.

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### 4.32.2.11. DEFINITIONS.

**A. Applying Augmentation.** The primary purpose of augmentation is to provide the operating flight crew members with in-flight rest relief. However, in-flight rest may not be the only reason for the application of augmentation. A certificate holder may augment the minimum required flight crew because their planned FDP and/or flight time may exceed their maximum applicable FDP and/or flight time limits prescribed for unaugmented operations. For example, an unaugmented flight crew is assigned an FDP starting at 0700 hour; with 5 planned segments during that FDP, the flight crew member's maximum applicable FDP limit would be 12.5 hours (see Table B to Part 117 – Flight Duty Period: Unaugmented Operations. Due to operational necessity, the planned FDP requires 13.5 hours.

1) The certificate holder has a few potential options available. First, they could potentially extend the flight crew member's FDP with pilot in command (PIC) concurrence. However, if the option of an extension is not available, the certificate holder could reduce the number of segments during that FDP to two segments (14-hour FDP limit) or plan to augment that FDP. Applying the augmentation FDP limits, a flight crew consisting of three pilots with a scheduled time of start of 0700, and using a Class 3 rest facility, the flight crew member's maximum applicable FDP limit would now be 15 hours. A similar approach can be applied to flight time limits. Considering the same scheduled time of start in an unaugmented operation, the planned flight time may exceed 9 hours. In this case, by using augmentation (three pilots), the flight crew would have a new flight time limit of 13 hours during that augmented FDP.

2) Flight crew members serving in an augmented crew are considered to be in excess of the minimum required flight crew member complement. Because the entire flight crew would consist of 3 or 4 pilots, their maximum applicable FDP limit would be determined by use of Table C of GACAR Part 117. Table C of GACAR Part 117 prescribes the flight crew member's FDP limits based upon three criteria: the FDP scheduled time of start, the number of pilots assigned to the FDP, and the classification of rest facility being used. Flight time limits for 3 and 4-pilot crews are prescribed in GACAR § 117.11(a)(2)(3), which are 13 and 17 hours, respectively.

**B. Evaluation and Qualification Inspection.** An evaluation and qualification inspection is a two-step process performed by the principal operations inspector (POI). The purpose of the inspection is to ensure the rest facility and sleep surface conforms to its design and operational

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criteria and conforms to the limitations and specifications prescribed in GACAR § 117.3. The first step is to review the data contained in the certificate holder's technical report for the rest facility being qualified. The second step is to perform a qualification inspection using the appropriate Qualification Analysis Statement (QAS) (See Figure 4.32.2.1., Qualification Analysis Statement Class 1 Rest Facility; Figure 4.32.2.2., Qualification Analysis Statement Class 2 Rest Facility; and Figure 4.32.2.3., Qualification Analysis Statement Class 3 Rest Facility).

**C. Technical Report.** The certificate holder will prepare a technical report pertinent to the class of rest facility being qualified explaining how the rest facility complies with GACAR Part 117 and the guidance in FAA AC 117-1. The purpose of the technical report is to provide the POI with the necessary supporting documentation for qualification of the rest facility. The technical report must identify the installation approval source for the specific class of rest facility being qualified. The installation approval source may be from the airplane's type certificate (TC) and reflected in the Type Certificate Data Sheet (TCDS) or a Supplemental Type Certificate (STC). In the event the FAA Flight Standardization Board (FSB) Report for that airplane type includes and identifies a specific rest facility that meets the criteria prescribed in GACAR § 117.3 for a specific class of rest facility, this data may be used as a substitute for the installation approval source provided the rest facility is identical to class included in the FSB.

1) The technical report must contain a complete list of the certificate holder's airplanes (by registration marks and serial number, make, model and series (M/M/S)) that correspond to the installation approval for the specific class of rest facility being qualified. The technical report is instrumental in providing relevant data applicable to all the rest facilities installed under a particular installation approval. Absence of this data will result in the GACA evaluating each rest facility separately.

2) When the certificate holder is prepared to have their rest facilities qualified they will make this request through their POI. With this notification, the certificate holder should provide their POI with a copy of a technical report. It is important for the certificate holder to recognize that a more organized and complete technical report will result in a smoother evaluation and qualification. The technical report should contain the following data:

a) A list of airplanes, by registration mark, serial number, M/M/S, classification of rest facility to be qualified, and the number of sleep surfaces installed under that classification.

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- b) The method for approval of the rest facility installation such as TC or STC or another acceptable means of approval. If applicable, a statement from the FSB stating the rest facility meets the criteria prescribed in GACAR § 117.3.
- c) Specific dimensions and layout of the rest facility and sleep surface (photographs, drawings, diagrams, etc.) and its location on the airplane.
- d) Operating instructions pertinent to the operation and use of the sleep surface and rest facility.
- e) Design features for the specific rest facility class qualification.
- f) Sound mitigation data for Class 1 rest facilities.
- g) Sound mitigation data and operating procedures applicable to curtain installed for a Class 2 rest facility.
- h) Any other appropriate approved data supporting the proposed qualification of rest facility.
- i) If applicable, a differences table identifying the differences associated with the class of rest facility under this installation approval.
- j) Augmented operations procedures.
- k) In the event the design of the rest facility requires some preparation by the crew prior to use, such as expanding sections, the evaluation request should include appropriate preparation procedures, and recommended qualification/training requirements (if required).

**D. Differences Table.** In any class of rest facilities under the same installation approval source, the design, location and layout should be identical. However, in the event differences exist in a class of rest facility under the same installation, the certificate holder should identify those differences and incorporate them into a differences table. The table should be included in the certificate holder's technical report.

**E. QAS.** There are three QAS documents, one document applicable for each classification of rest

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facility. Each QAS (Class 1, 2 or 3) document contains a checklist of items applicable to that classification of rest facility. When evaluating and qualifying a rest facility, the inspector must use the appropriate QAS for the classification being conducted.

**F. Completing the QAS.** Prior to completing, the POI should review the data within the certificate holder's technical report that outlines the design criteria and specifications for the class of rest facility being qualified. This data should outline the information supporting the class of rest facility to be qualified. The QAS should be completed in the following manner:

- 1) Certificate Holder: Enter the name of the certificate holder.
- 2) Certificate No.: Enter the certificate holder's air carrier certificate number.
- 3) TC/STC Approval: For Class 1 rest facilities qualification only, in the installation approval is under the airplane TC, enter the TC number. For all classes of rest facilities where the installation approval is under a STC approval, enter the STC approval for that class of rest facility.
- 4) M/M/S: Enter the airplane M/M/S.
- 5) Registration Mark: Enter the airplane registration mark.
- 6) Serial No.: Enter the serial number of the airplane.
- 7) Number of Sleep Surfaces: Enter the number of sleep surfaces installed in the airplane under the classification for which the rest facility is qualified.

**G. Operation Specification (OpSpec) A117.** OpSpec A117, Use of Onboard Flight Crew Member Rest Facilities, must be issued to the certificate holder prior to conducting augmented flight crew member operations using the FDP limits prescribed in Table C of GACAR Part 117. OpSpec A117 serves as the source document identifying each of the certificate holder's airplanes having installed rest facilities based upon the class of rest facility and the number of sleep surfaces under that classification. This data corresponds to the airplane (M/M/S, registration mark and serial number) listed in OpSpec A117.

**H. Relationship Between the QAS and OpSpec A117.** The completion of a QAS initiates the issuance of, or update to, the certificate holder's OpSpec A117. The POI will be responsible for

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the issuance of OpSpec A117 and, if applicable, the subsequent addition or deletion of the certificate holder's airplanes having rest facilities.

NOTE: The certificate holder's technical report should contain a list of all their airplanes (by M/M/S) that have rest facilities under the same rest facility classification and installation approval. When preparing the certificate holder's OpSpec A117, the POI should have a copy of the technical report and the completed QAS. Refer to the technical report for a list of all the certificate holder's airplanes (by M/M/S and registration marks and serial number) that have the same installation approval and the same class of rest facility qualified by this QAS. Insert each of these airplanes by M/M/S, registration mark and serial number, class of rest facility, qualification date, and the number of sleep surfaces.

**I. Augmented Operations Procedures.** The certificate holder should develop augmented operations procedures relative to the use of the specific onboard rest facilities and sleep surface. The certificate holder should provide the POI with a copy of their augmentation operating procedures. At a minimum, the certificate holder's augmented operations procedures should include the following:

- 1) Specific operating procedures relative to the operation of the rest facility and sleep surface for augmented flight crew operations,
- 2) Use of Table C in GACAR Part 117 to determine a flight crew member's maximum applicable FDP limits,
- 3) Procedures for the loss of cabin altitude while in the rest facility,
- 4) Emergency communications procedures between the flight deck crew and the flight crew member(s) in the rest facility,
- 5) Procedures for smoke in the cabin for flight crew members in the rest facility, and
- 6) Procedures for dealing with fires in the rest facility.

### **4.32.2.13. EVALUATION AND QUALIFICATION.**

**A. Paths for Evaluation and Qualification of Rest Facilities.** Evaluation and qualification of onboard rest facilities will follow one of four paths:

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- 1) Existing rest facilities (adequacy evaluated in accordance with FAA AC 121-31),
- 2) Newly installed Class 1,
- 3) Newly installed Class 2 and 3, and
- 4) Previously qualified rest facilities (Class 1, 2, or 3 in accordance with the criteria established in GACAR Part 117).

**B. Responsibility for Evaluating and Qualifying a Rest Facility.** The responsibility for evaluating and qualifying rest facilities is determined by the classification sought by the certificate holder.

- 1) Class 1 Rest Facilities. Due to the specification and design criteria of a Class 1 facility, the senior Inspector having responsibility of that airplane type will conduct the evaluation and qualification. The senior Inspector will keep the POI having oversight responsibility of that certificate holder involved throughout the process.
- 2) Class 2 and 3 Rest Facilities. The POI having oversight responsibility of that certificate holder will be responsible for conducting the evaluation and qualification of Class 2 and 3 rest facilities.

**C. The Qualification Process.** The classification of the onboard rest facilities (i.e., Class 1, 2, and 3) is one of the three elements used to determine the augmented flight crew member's maximum FDP limit. Therefore, it is imperative that the certificate holder's rest facilities are properly evaluated and qualified as meeting one of the classifications (Class 1, 2 or 3) prescribed in § 117.3 prior to using that airplane in augmented flight crew member operations.

- 1) Early identification of the qualification project is essential for ensuring a timely rest facility evaluation. Requests for GACA qualification of the rest facility should be made in a timely manner so that an inspection and evaluation of the rest facility may be scheduled after the installation is complete for newly installed facilities, and for existing facilities. Therefore, the certificate holder should submit their request for rest facility qualification to their POI as early as possible.
- 2) Requests should also include a technical report (as described in this document) relative to the rest facility being qualified. In the event the design of the rest facility requires some

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preparation by the crew prior to use, such as expanding sections, the evaluation request should include appropriate preparation procedures, and recommended qualification/training requirements (if applicable).

**D. Installation Approval.** The data contained in the installation approval specifies the design criteria, operational specifications and materials used along with the layout of the facility as well as its location on the airplane. Each class of rest facility installed under a specific approval should be identical to another under of that same approval. For this reason, when the certificate holder prepares their technical report they should list in the technical report each airplane with rest facilities (M/M/S, registration and serial number) corresponding to its installation approval source for that classification. Therefore, when evaluating a certificate holder's rest facility, the POI need only inspect one class of rest facility under that installation approval per airplane type. As an example, a certificate holder operates ten (10) Boeing B-767 airplanes, each having two (2) Class 2 rest facilities installed under the same installation approval and the layout is identical. Under this example only one of the certificate holder's ten (10) B-767's need to be evaluated as the remaining nine (9) B-767 airplanes will fall under this qualification. The certificate holder's technical report should reflect ten (10) B-767 (individually listed by registration mark and serial number, and M/M/S) under the same installation approval, each airplane having two (2) Class 2 rest facilities.

**E. Rest Facility Differences.** If differences exist in a particular class of rest facility under the same installation approval, these differences must be reflected in the certificate holder's technical report corresponding to the specific airplane by M/M/S and registration and serial number. Such differences include, but are not limited to, number of sleep surfaces, the sleep surface, sound mitigation data for Class 1 and 2 facilities, design and layout, location of the rest facility and airplane type. The certificate holder should develop a table outlining the rest facility differences applicable to the class of rest facility, the airplane type and the installation approval for that rest facility. The differences table should be incorporated into the certificate holder's technical report for that class of rest facility and airplane type. The differences table must be evaluated to determine if individual evaluations must be conducted for each of the rest facilities having those differences. If the differences are common to a given number of airplanes of the same type, then only one of those airplane's rest facilities with common differences needs to be evaluated. Otherwise, each airplane's rest facilities with differences must be evaluated individually.

**F. Conducting the Rest Facility Evaluation and Qualification Inspection.** When conducting a rest facility evaluation and qualification inspection:

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- 1) For Class 1 rest facilities, the Director, Flight Operations Division will assign a senior Inspector who will review the data in the certificate holder's technical report and supporting documentation to determine if it supports Class 1 criteria. Using the data in the technical report and conducting a physical inspection of the rest facility, the senior Inspector will complete the Class 1 QAS checklist. If the senior Inspector determines that an item required for the Class 1 qualification does not meet the criteria, the senior Inspector will notify the POI of the findings. The certificate holder will be advised by the POI that they have three options. They can make the necessary corrective actions and reschedule another inspection by the senior Inspector, evaluate the rest facility to a lower class (i.e., Class 1 to a Class 2) or pursue a Fatigue Risk Management System (FRMS) application. If the certificate holder elects to have the rest facility evaluated to a lower class, that evaluation responsibility rests with the POI. In this case the senior Inspector would serve in an advisory role to the POI. If, however, the senior Inspector qualifies the rest facility as a Class 1, the senior Inspector will forward a copy of the completed Class 1 QAS to the POI.
- 2) For Class 2 rest facilities, the POI will review the data in the certificate holder's technical report and supporting documentation to determine it supports Class 2 criteria. Using the data in the technical report and conducting a physical inspection of the rest facility, the POI will complete the Class 2 QAS checklist. If the POI determines that an item required for the Class 2 qualification does not meet the criteria, the POI will advise the certificate holder that they have three options. They can make the necessary corrective actions and reschedule another inspection with the POI, evaluate the rest facility to a lower class (i.e., Class 2 to a Class 3), or contact AFS-200 to pursue an FRMS application. If the certificate holder elects to have the rest facility evaluated to a lower class, that evaluation responsibility rests with the POI. If the POI determines the rest facility qualifies as a Class 2, the POI will complete the Class 2 QAS.
- 3) For Class 3 rest facilities, the POI will review the data in the certificate holder's technical report and supporting documentation to determine it supports Class 3 criteria. Using the data in the technical report and conducting a physical inspection of the rest facility, the POI will complete the Class 3 QAS checklist. If the POI determines that an item required for the Class 3 qualification does not meet the criteria, the POI will advise the certificate holder that they have two options. They can make the necessary corrective actions and reschedule another inspection with the POI, or pursue an FRMS application. If the POI determines that the rest facility qualifies as a Class 3, the POI will complete the Class 3 QAS.

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**G. Qualifying a Class 1 Rest Facility and Existing Rest Facilities (Adequacy Evaluated in Accordance with FAA AC 121-31).** If the request for qualification is for a Class 1 rest facility, the POI will forward that request to the senior Inspector having responsibility for that airplane type. The certificate holder will provide the POI with the instructions for continued airworthiness (ICA), the technical report, approved data and other supporting data relative to the class of rest facility at the time of the qualification request. Along with this request, the POI will forward a copy of the technical report, approved data and other supporting documentation to the senior Inspector. The senior Inspector will coordinate with the POI throughout the evaluation. The senior Inspector will coordinate with the certificate holder to schedule a time and location to conduct the evaluation. The senior Inspector will conduct an evaluation and qualification to evaluate and inspect the rest facility for compliance with part 117. The qualification is accomplished by use of the Class 1 QAS checklist. If a question in the checklist yields a “NO” response, it means the rest facility is not qualified as a Class 1. Therefore, to be qualified as a Class 1 rest facility, each question in the Class 1 QAS must yield a “YES” response.

- 1) Once the rest facility has been qualified as meeting the criteria and specifications prescribed in GACAR Part 117 for a Class 1, the senior Inspector will issue a Class 1 QAS for that rest facility. Once issued, the senior Inspector will forward a copy of the completed Class 1 QAS to the POI to initiate the issuance of OpSpec A117.
  
- 2) The qualification will remain in effect until a modification to the rest facility or a component of the rest facility renders it noncompliant with the criteria and specifications prescribed in GACAR Part 117 for that classification, or the GACA determines the rest facility no longer meets the criteria and specification(s) prescribed in GACAR Part 117 for that classification.

**H. Qualifying Class 2 and 3 Rest Facilities.** Requests for GACA qualification of the rest facility should be made in a timely manner to the certificate holder’s POI so that an inspection and evaluation of the rest facility may be scheduled after the installation is complete. Class 2 and 3 flight crew member rest facilities will be inspected and evaluated by the POI having oversight responsibilities of the certificate holder. The certificate holder will provide the POI with the proposed ICA, technical report, approved data and other supporting data relative to the class of rest facility at the time of the qualification request. Also, in the event the design of the rest facility requires some preparation by the crew prior to use, such as expanding sections or leg and foot support, the evaluation request should include appropriate preparation procedures, and recommended qualification/training requirements.

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- 1) Each rest facility is installed under a specific approval. The data contained in the approval specifies the design criteria, operational specifications material to be used along with the layout of the facility, as well as its location on the airplane. Each rest facility installed under a specific approval should be identical to another under of that same approval. For this reason, when the certificate holder prepares their technical report they should list each airplane with rest facilities (M/M/S, registration mark and serial number) corresponding to its installation approval source. Therefore, when evaluating a certificate holder's rest facility, the POI need only inspect one rest facility under that installation approval per airplane type.
- 2) The certificate holder will provide the POI with a copy of the technical report and other supporting documentation relative to the rest facility to be qualified. The POI will coordinate with the certificate holder to schedule a time and location to conduct the evaluation. They will conduct an evaluation and qualification to evaluate and inspect the rest facility for compliance with GACAR Part 117. The qualification is accomplished by use of the Class 2 or 3 QAS checklist, as appropriate. Any question in the checklist that yields a "NO" response means the rest facility is not qualified for that classification. Therefore, to be qualified as a Class 2 or 3 rest facility, as appropriate, each question in the respective QAS must yield a "YES" response. Otherwise, the rest facility is not qualified.
- 3) If the POI has determines the rest facility meets either the Class 2 or 3 qualification, the POI will issue the appropriate QAS for that rest facility classification. A copy of the QAS will be provided to certificate holder. The QAS will remain in effect until a modification to the rest facility or a component of the rest facility renders it noncompliant with the criteria and specifications prescribed in part 117 for that classification, or the GACA determines the rest facility no longer meets the criteria and specification(s) prescribed in GACAR Part 117 for that classification.

**I. FRMS Application for Rest Facilities.** In the event a certificate holder elects to apply for an FRMS authorization for rest facilities, the POI should direct the certificate holder to review the current edition of FAA AC 120-103, Fatigue Risk Management Systems for Aviation Safety, and ICAO Doc 9966, FRMS – Manual for Regulators.

**J. Modifications and Repairs to Rest Facilities.** Modifications and repairs that alter any part of the original specifications of the rest facility may disqualify it from the previously qualified classification.

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**K. Requalification of Previously Qualified Rest Facilities.** Requalification of a previously qualified rest facility is required when an item or component associated with the rest facility is modified or altered in any way, except when an inoperative item or component of the rest facility is covered and properly deferred in accordance with the certificate holder's MEL and its associated procedures. The purpose for requalifying a previously qualified rest facility is to determine that the modification(s) or alteration(s) have not changed the facility's physical specifications beyond that classification previously qualified and is in compliance with GACAR Part 117. If the GACA determines the modified or altered rest facility does not meet the classification previously qualified, the rest facility may be evaluated to a different (lower) classification, if applicable. If the GACA determines that the rest facility does not meet any of the three classifications, the airplane may not be used for augmented flight crew operations and may not use the augmented FDP limits while operating that airplane. If determined that the rest facility does not meet any of the three classifications, or if a rest facility loses its qualification, the POI must remove the airplane from the certificate holder's OpSpec A117.

- 1) The senior Inspector responsible for that airplane type is responsible for inspection, evaluation and requalification of previously qualified Class 1 rest facilities. Inspection and evaluation of previously qualified Class 2 and 3 onboard rest facilities is the responsibility of the POI.
- 2) For requalification of a Class 1 rest facility, the senior Inspector will follow the same process outlined in this document for the qualification of Class 1 rest facilities. For Class 2 and 3 rest facilities, the POI having oversight responsibility of the certificate holder will follow the same process outlined in this document for the qualification of Class 2 and 3 rest facilities, as appropriate.
- 3) Once the airplane's onboard rest facility has been satisfactorily requalified, the POI will complete the applicable QAS. The completed QAS will initiate the update to the certificate holder's OpSpec A117. The qualification will remain in effect until a modification to the rest facility or a component of the rest facility renders it noncompliant with the specifications prescribed in GACAR Part 117, or the GACA determines the rest facility no longer meets the specification(s) prescribed in GACAR Part 117 for that classification.

**L. Upgrading a Rest Facility.** In some cases, the certificate holder may upgrade their rest facility to meet the specifications for a higher rest facility classification, which will require that rest facility to be requalified before using the FDP limits applicable for the higher rest facility

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classification. If the requalification is satisfactory to a higher classification, prior to using the airplane for augmented operations with the higher FDP limits, the certificate holder's OpSpec A117 must be updated to reflect the newly qualified rest facility.

**M. Downgrading a Rest Facility.** If a rest facility is downgraded to a lower classification for reasons other than those identified in the certificate holder's MEL, the POI must reflect this downgraded status by conducting an evaluation and qualification of the rest facility, complete the appropriate class of QAS, and reissue the certificate holder OpSpec A117 reflecting the new classification of rest facility and number of sleep surfaces under that new classification.

**N. FRMS Authorization.** In certain cases a certificate holder may elect to apply for an FRMS authorization specific to a rest facility. For example, a certificate holder's rest facility may not comply with all the criteria and specifications outlined in GACAR Part 117 for a Class 1. The certificate holder would develop an alternative method of compliance (AMOC) that demonstrates an equivalent level of safety applicable to the safety standards set forth in GACAR Part 117. After completion of the studies and validation of the data collected, if the FRMS application is approved OpSpec A10 (FRMS authorization) must be issued.

**O. Issuance of the QAS and OpSpec A117.** Prior to conducting augmented flight crew operations, and using the augmented flight crew member FDP limits, the certificate holder must be issued OpSpec A117 reflecting the airplane and the classification of rest facility to be used. The issuance of OpSpec A117 is contingent on the completion of the appropriate QAS qualifying that rest facility under one of the three classifications. The POI should refer to the guidance in Volume 15, Chapter 3, Section 1 for the issuance of OpSpec A117.

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**Figure 4.32.2.1. Qualification Analysis Statement Class 1 Rest Facility**

QUALIFICATION ANALYSIS STATEMENT CLASS 1 REST FACILITY			
Certificate Holder	Certificate No.	TC/STC Approval	
Make/Model/Series	Registration Mark	Serial Number	No. of Sleep Surfaces
<p>A Class 1 rest facility is defined as a bunk or other surface that allows for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled, allows the flight crew member to control light, and provides isolation from noise and disturbance.</p> <p>Certification of this Qualification Analysis Statement (QAS) qualifies this installed onboard flight crew member rest facility as a Class 1 rest facility. Unless otherwise authorized by an GACA-approved Fatigue Risk Management System (FRMS), when conducting augmented flight crew member operations, the certificate holder and the flight crew members must comply with the maximum flight duty period limits (FDP) prescribed in Table C of GACAR Part 117 based upon the use of this qualified Class 1 rest facility, the flight crew member's time of start and the number of assigned flight crew members. However, when an augmented flight crew consisting of four or more pilots using multiple classes of rest facilities installed on a single aircraft, the maximum FDP limits applicable to the lowest classification of installed rest facility (Class 1 is the highest and Class 3 is the lowest classification) apply based upon the number of assigned flight crew members, start time of the flight crew member's FDP, and classification of rest facility.</p> <p>This qualification will remain in effect until a modification to this rest facility renders it noncompliant with the specifications qualifying it as a Class 1 rest facility, or the GACA determines the rest facility no longer meets the requirements prescribed in GACAR Part 117 for a Class 1 rest facility.</p> <p>Modifications and repairs that alter any part of the original specifications for a Class 1 rest facility may disqualify it from its previously qualified classification. If the rest facility classification is disqualified, requalification of the rest facility is required, except when an inoperative item or component associated with this rest facility is covered and deferred in accordance with the certificate holder's minimum equipment list (MEL).</p> <p>Prior to conducting augmented flight crew operations, the certificate holder must be issued <u>OpSpec A117, Use of Onboard Flight Crew Member Rest Facilities</u>, authorizing the use of specific onboard rest facilities.</p>			

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Evaluation and Qualification Analysis			
Item No.	Item	YES	NO
1.	Is the physical location of each rest facility of this classification located in an area other than the economy section of the airplane?		
2.	Does the sleeping surface a bunk or other surface allow for a flat sleeping position and is located separate from both the flight deck and passenger cabin in an area that is temperature-controlled?		
3.	Are the sleeping surfaces designed so that they are flat and as level as practicable during cruise flight?		
4.	Do the dimensions of each sleep surface meet the 30"x78" recommendation and the volume per individual of 1.0 m <sup>3</sup> (35 feet <sup>3</sup> )?		
5.	Does the rest facility provide a suitable means to ensure occupant privacy for each sleeping surface area, e.g., curtains in an over-and-under arrangement or a divider curtain in a side-by-side arrangement.		
6.	Does the rest facility allow the flight crew member to control light?		
7.	Does the facility provide isolation from noise and disturbance?		
8.	Is the rest facility area temperature-controlled?		
9.	Is airflow and temperature control available to provide a uniformly well-ventilated atmosphere free from drafts, cold spots, and temperature gradient?		
10.	Are suitable personal articles stowage and occupant restraint systems provided to each occupant's sleeping surfaces as well as each occupant of any seats located in crewmember rest facilities?		
11.	Are there one or more operational lighted "FASTEN SEAT BELTS" signs within the view of the occupants of each sleeping surface located within the rest facility?  a.) If so, are these lighted signs dimmable for sleeping purposes?		
12.	Is an operational interphone available for the cockpit crewmembers to communicate with the sleeping crewmember(s)?  Note: The GACA recommends that the public address system or an alternative means should include provisions to provide only relevant information to crewmembers in the crewmember rest facility (e.g., in flight emergencies, aircraft depressurization, preparation of compartment occupants for landing).		
13.	Is approved oxygen equipment provided for each crewmember using a sleeping surface, including an aural alert to awaken a sleeping crewmember?		
14.	Does the rest facility have operational emergency lighting?		
15.	Does this rest facility meet the qualification specifications for a class 1 rest facility?		

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**Figure 4.32.2.2. Qualification Analysis Statement Class 2 Rest Facility**

QUALIFICATION ANALYSIS STATEMENT CLASS 2 REST FACILITY			
Certificate Holder	Certificate No.	STC Approval	
Make/Model/Series	Registration Mark	Serial Number	No. of Sleep Surfaces
<p>A Class 2 rest facility is defined as a seat in an aircraft cabin that allows for a flat or near flat sleeping position; is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation; and is reasonably free from disturbance by passengers or flight crew members.</p> <p>Certification of this Qualification Analysis Statement (QAS) qualifies this installed onboard flight crew member rest facility as a Class 2 rest facility. Unless otherwise authorized by an GACA-approved Fatigue Risk Management System (FRMS), when conducting augmented flight crew member operations, the certificate holder and the flight crew members must comply with the maximum flight duty period limits (FDP) prescribed in Table C of GACAR Part 117 based upon the use of this qualified Class 2 rest facility, the flight crew member's time of start and the number of assigned flight crew members. However, when an augmented flight crew consisting of four or more pilots using multiple classes of rest facilities installed on a single aircraft, the maximum FDP limits applicable to the lowest classification of installed rest facility (Class 1 is the highest and Class 3 is the lowest classification) apply based upon the number of assigned flight crew members, start time of the flight crew member's FDP, and classification of rest facility.</p> <p>This qualification will remain in effect until a modification to this rest facility renders it noncompliant with the specifications qualifying it as a Class 2 rest facility, or the GACA determines the rest facility no longer meets the requirements prescribed in GACAR Part 117 for a Class 2 rest facility.</p> <p>Modifications and repairs that alter any part of the original specifications for a Class 2 rest facility may disqualify it from its previously qualified classification. If the rest facility classification is disqualified, requalification of the rest facility is required, except when an inoperative item or component associated with this rest facility is covered and deferred in accordance with the certificate holder's minimum equipment list (MEL).</p> <p>Prior to conducting augmented flight crew operations, the certificate holder must be issued <u>OpSpec A117, Use of Onboard Flight Crew Member Rest Facilities</u>, authorizing the use of specific onboard rest facilities.</p>			

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Evaluation and Qualification Analysis		YES	NO
Item No.	Item		
1.	Is the rest facility located in an area other than the economy section of the airplane?		
2.	Is the rest facility placarded to designate it as a Class 2 rest facility?		
3.	Does the seat (sleep surface) in the rest facility allow for a flat or near flat sleeping position?		
4.	Is the rest facility separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation?		
5.	Is the location of the rest facility reasonably free from disturbance by passengers or flight crew members?		
6.	Is the rest facility configured so that a passenger may not occupy a seat beside the flight crew member?		
7.	With the curtain fully extended around the seat, does the curtain provide darkness?		
8.	Does this rest facility meet the qualification criteria and specifications for a class 2 rest facility?		

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**Figure 4.32.2.3. Qualification Analysis Statement Class 3 Rest Facility**

<b>QUALIFICATION ANALYSIS STATEMENT CLASS 3 REST FACILITY</b>			
Certificate Holder	Certificate No.	STC Approval	
Make/Model/Series	Registration Mark	Serial Number	No. of Sleep Surfaces
<p>A Class 3 rest facility is defined as a seat in an aircraft cabin or flight deck that reclines at least 40 degrees and provides leg and foot support.</p> <p>Certification of this Qualification Analysis Statement (QAS) qualifies this installed onboard flight crew member rest facility as a Class 3 rest facility. Unless otherwise authorized by an GACA-approved Fatigue Risk Management System (FRMS), when conducting augmented flight crew member operations, the certificate holder and the flight crew members must comply with the maximum flight duty period limits (FDP) prescribed in Table C of GACAR Part 117 based upon the use of this qualified Class 3 rest facility, the flight crew member's time of start and the number of assigned flight crew members. However, when an augmented flight crew consisting of four or more pilots using multiple classes of rest facilities installed on a single aircraft, the maximum FDP limits applicable to the lowest classification of installed rest facility (Class 1 is the highest and Class 3 is the lowest classification) apply based upon the number of assigned flight crew members, start time of the flight crew member's FDP, and classification of rest facility.</p> <p>This qualification will remain in effect until a modification to this rest facility renders it noncompliant with the specifications qualifying it as a Class 3 rest facility, or the GACA determines the rest facility no longer meets the requirements prescribed in GACAR Part 117 for a Class 3 rest facility.</p> <p>Modifications and repairs that alter any part of the original specifications for a Class 3 rest facility may disqualify it from its previously qualified classification. If the rest facility classification is disqualified, requalification of the rest facility is required, except when an inoperative item or component associated with this rest facility is covered and deferred in accordance with the certificate holder's minimum equipment list (MEL).</p> <p>Prior to conducting augmented flight crew operations, the certificate holder must be issued <u>OpSpec A117, Use of Onboard Flight Crew Member Rest Facilities</u>, authorizing the use of specific onboard rest facilities.</p>			

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### **VOLUME 4. AIR OPERATOR & AIR AGENCY - ADMINISTRATION**

#### **CHAPTER 33. AIRCRAFT NETWORK SECURITY PROGRAM**

##### **Section 1. Evaluating an Operator's Aircraft Network Security Program**

**4.33.1.1. GACA ACTIVITY REPORT (GAR).** The inspector must create a GAR entry for each aircraft type series listed in operations specification (OpSpec) D98, Aircraft Network Security Program (ANSP).

**A. Airworthiness:** 3315 (original); 3316 (revision).

**B. Cabin Safety:** 8326 (initial); 8327 (revision).

**C. Flight Operations:** 1326 (initial); 1327 (revision).

**4.33.1.3. OBJECTIVE.** This section contains information and guidance that the principal inspectors (PI) use when evaluating an operator's ANSP.

NOTE: Concurrence of ASIs in other specialties is required to assure all aspects of training are addressed, and to assure that the full impact of the e Enabled configuration of the aircraft is assessed.

**4.33.1.5. GENERAL.** This section contains a general overview of the requirements for evaluating an ANSP under GACAR Parts 121 and 125. This section contains information and guidance about granting authorization for an operator's ANSP.

**4.33.1.7. ACTION.** The ANSP is authorized in OpSpec D98. Refer to eBook Volume 15 for further details on how to complete this OpSpec template.

**4.33.1.9. NEW USE OF TECHNOLOGY.** Previously, aircraft designers used aviation (ARINC 429/629) or Military Standard (MIL-STD) data buses to interconnect flight critical avionics systems. TCP and/or IP were used only to support the passenger information and entertainment systems, which were physically and logically separated from the flight critical avionics systems. New aircraft designs use TCP/IP technology for the main aircraft backbone connecting flight critical avionics as well as passenger information and entertainment systems in a manner that virtually makes the aircraft an airborne interconnected network domain server.

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**A. External Systems Access.** The architecture of this airborne network may allow read and/or write access to and/or from external systems and networks, such as wireless airline operations and maintenance systems, satellite communications, email, the Internet, etc. Onboard wired and wireless devices may also have access to portions of the aircraft's digital data buses that provide flight critical functions.

**B. E-Enabled Aircraft.** Aircraft using TCP/IP technology in this manner are commonly referred to as e-Enabled aircraft. The design of these e-Enabled aircraft makes it difficult to maintain the certificated configuration of the aircraft without following procedures documented in an ANSP. OpSpec D98 is necessary to confirm that operators have the skills, tooling, and procedures in place to accomplish the requirements of the manufacturer's aircraft security document, and the recommended best practices appropriate to their operations.

NOTE: Aircraft that require an ANSP include any aircraft produced or modified that require the manufacturer or design approval holder to obtain GACA approval for the security guidance document provided to the operator. This includes the Boeing B-787-8, B-747-8, Airbus A-350, A-380, Bombardier CS100 and CS300 aircraft. (This example is not all inclusive.)

**4.33.1.11. RISK.** E-Enabled aircraft have the capability to reprogram flight critical avionics components wirelessly and via various data transfer mechanisms. This capability alone, or coupled with passenger connectivity on the e-Enabled aircraft network, may result in cyber security vulnerabilities from intentional or unintentional corruption of data and/or systems critical to the safety and continued airworthiness of the airplane. Credible examples of potential misuse include the potential for:

- Malware to infect an aircraft system,
- An attacker to use onboard wireless to access aircraft system interfaces,
- Denial of service of wireless interfaces,
- Denial of service of safety critical systems,
- Misuse of personal devices that access aircraft systems, and
- Misuse of off-board network connections to access aircraft system interfaces.

**4.33.1.13. REGULATORY REQUIREMENTS.** The existing regulations did not anticipate this type of system architecture or electronic access to aircraft systems that provide flight critical functions. Current system safety assessment policy and techniques do not address potential cyber security vulnerabilities that unauthorized access to aircraft data buses and servers could cause.

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Aircraft network systems are certificated through various means, including but not limited to type certificates (TC) and Supplemental Type Certificates (STC) that include special condition requirements (for Boeing aircraft) and the Airworthiness Limitation Section (ALS) of the instructions for continued airworthiness (ICA) (for Airbus aircraft). GACAR Part 43 requires each person performing maintenance, alteration, or preventive maintenance on an aircraft, engine, propeller, or appliance to use the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or ICA prepared by its manufacturer; or other methods, techniques, and practices acceptable to the Administrator. PIs will determine that an operator's ANSP is in compliance with applicable regulations and manufacturer's instructions. The manufacturer's instructions may be in the form of a recommended aircraft security program, airworthiness limitations, or other instructions.

### **4.33.1.15. REFERENCES, FORMS, AND JOB AIDS.**

#### **A. References (current editions):**

- RTCA DO-326, Airworthiness Security Process Specification, <http://www.rtca.org/default.asp>.

#### **B. Forms.** None.

#### **C. Job Aids.** None.

### **4.33.1.17. OPERATOR ACTION.**

#### **A. Develop an ANSP.** Operators of e-Enabled aircraft must develop and maintain an ANSP that is sufficiently comprehensive in scope and detail to accomplish the following:

- 1) Ensure that security protection is sufficient to prevent access by unauthorized sources external to the aircraft.
- 2) Ensure that security threats specific to the certificate holder's operations are identified and assessed, and that risk mitigation strategies are implemented to ensure the continued airworthiness of the aircraft.
- 3) Prevent inadvertent or malicious changes to the aircraft network, including those possibly caused by maintenance activity.

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4) Prevent unauthorized access from sources onboard the aircraft.

**B. Guidelines for Authorization.** Operators of e-Enabled aircraft during initial certification (including the addition of new types of e-Enabled aircraft) should ensure that the initial compliance statement clearly describes the procedures that the operator will use for the ANSP. The ANSP is authorized in OpSpec D98. The operator must develop a section in its Maintenance Manual (MM) or other appropriate manual that provides detailed instruction on:

- Roles and responsibilities, including persons with authority and responsibility;
- Training/qualifications;
- Control of maintenance laptop access and use;
- Control of access to airport wired and wireless service network;
- Controlling access to Loadable Software Airplane Part (LSAP) librarian resources;
- Creating secure parts signing process and controlling access to private keys;
- Control/monitor of physical access to aircraft;
- Control of aircraft conformity to type design, as amended;
- Provisions for parts pooling and parts borrowing;
- Procedures for part exchanges within its own fleet;
- Event recognition and response; and
- Event evaluation process with considerations for program improvements.

**C. Verify.** The PI should encourage the operator to submit the request for authorization for OpSpec D98, along with ANSP program documents at least 60 days prior to planned operation of the e Enabled aircraft. The PI will verify that the operator has established appropriate event recognition, response processes, and security awareness training within their respective program area.

**4.33.1.19. PROCESS.** PIs will collaborate with certificate holders to determine the mandatory and recommended requirements of the manufacturer's security document.

**A. Verify the Most Recent Version.** Verify that the certificate holder has the most recent version of the manufacturer's security document.

**B. Compare the Requirements and Recommendations.** Compare the requirements and recommendations in the manufacturer's security document to those in the ANSP. Verify that the certificate holder addresses the requirements, and that any recommendations appropriate to the

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certificate holder operations are included.

**C. Verify the Appropriate Changes.** Verify that appropriate changes are reflected in the certificate holder maintenance program and that the MM is revised accordingly. For example, if an ANSP states there is a process to validate the manufacturer's digital signature on software parts received, that process should be described in the "Parts Receiving" section of the MM. Also, if ANSP sensitive parts are received from a parts pool, the parts pooling procedures should address this.

### **D. Reserved.**

### **E. Reserved.**

**F. Data Security Manager.** Although not a requirement for every manufacturer's security document, it is critical that the ANSP identify a data security manager (or equivalent). The identity may be by title, organization, and office in the ANSP, provided the certificate holder submits a letter in writing to the GACA with the name and contact information for the data security manager. The ANSP should state that the operator shall notify the GACA within 5 days of subsequent changes to the data security manager. The data security manager would be the person with primary responsibility for the ANSP and would serve as the focal point for interface with the GACA regarding data security.

**4.33.1.21. MERGERS, ACQUISITIONS, AND PROGRAM CHANGES.** When two or more ANSP programs consolidate because of a merger or acquisition, the consolidation of those programs is of particular importance. The PIs must give priority to the accurate consolidation of those programs. Once the PI accepts the surviving program, the operator should take action to ensure security records, reports, and logs are maintained, archived, or transferred as appropriate from the existing program into the surviving program. Changes to an existing ANSP program also require PI evaluation, authorization, and oversight. The PI must accept the transition procedures. During this transition, the PI will determine the time period required for maintaining the two systems in parallel operation. The surviving program should have at least the same capability as the existing program. The integration of the existing and surviving programs must maintain the integrity of the security system.

**4.33.1.23. CONTRACT MAINTENANCE PROVIDERS.** The operator must ensure the contract maintenance provider complies with its ANSP program as required by GACAR § 121.659(b) or GACAR § 125.305. The operator will verify compliance with this requirement by use of the audit process required by its Continuing Analysis and Surveillance System (CASS) and Continuous

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Airworthiness Maintenance Program (CAMP) as required by GACAR §§ 121.671 and 121.691, or GACAR § 125.309(b). A certificated repair station that performs maintenance, preventive maintenance, or alterations for an operator that has an ANSP authorized under OpSpecs D98 must follow the operator's program as required by GACAR § 145.83.

### **4.33.1.25. TASK OUTCOMES.**

**A. Complete the GAR.** Use the GAR codes appropriate to initial ANSP authorization or revision thereof.

**B. Complete the Task.**

**C. Document the Task.**

**4.33.1.27. FUTURE ACTIVITIES.** Routine. PIs will conduct periodic routine surveillance of an operator's ANSP to verify that the operator maintains network security and that the operator made no significant changes to the program without further PI concurrence. PIs will verify that the records and security logs continue to contain the required information to show compliance. If the operator makes changes to the ANSP (even when the change is driven by a revision to the manufacturer's security document), or adds additional models of e-Enabled aircraft, the must PI determine if the program requires reevaluation.

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**CHAPTER 34. AUTHORIZATION OF E-LEARNING TRAINING PROGRAMS**

**Section 1. Authorization of E-Learning Training Programs**

**4.34.1.1. DEFINITIONS/ABBREVIATIONS:** For the purpose of this section, the following definitions/abbreviations apply:

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<b>Training provider:</b>	GACA regulated entities providing training in compliance with GACAR's requirement.
<b>Student:</b>	A person who is trained by a GACA regulated entity in compliance with GACAR's requirements.
<b>'Instructor-based':</b>	When the instructor is responsible for teaching the student
<b>'Student-based':</b>	Means that the student is responsible for the learning progress
<b>'Blended training':</b>	Includes different instructional methods and tools, different delivery methods, different scheduling (synchronous/asynchronous) or different levels of guidance. Blended training allows the integration of a range of learning opportunities
<b>Classroom:</b>	A physical, appropriate location where learning takes place
<b>Remote learning:</b>	When the student and instructor, or source of information, are separated by time or distance and cannot meet in a traditional classroom setting. Information is typically transmitted via technology (email, discussion boards, video conference, audio bridge or data carrier such as USB, DVD, etc.) so that no physical presence in the classroom is required. It can be synchronous or asynchronous.
<b>Virtual classroom:</b>	A virtual environment, not physical, location where synchronous learning takes place
<b>Computer-based training (CBT):</b>	Any interactive means of structured training using a computer to deliver a content. It needs to be complemented with close assistance by an instructor

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<b>Distance learning asynchronous:</b>	Training situations in which instructors and students are physically separated. The instructor and the students do not interact at the same time. In pilot training it is applicable only in modular courses
<b>Distance learning synchronous:</b>	Training situations in which instructors and students are physically separated. It is synchronous if the instructor and the students interact at the same time (real time).
<b>E-learning:</b>	Training via a network or electronic means, with or without the support of instructors (e-tutors)
<b>Mobile learning (M-learning):</b>	Any sort of learning that happens when the student is not at a fixed, predetermined location, using mobile technologies
<b>Web-based training (WBT):</b>	Generic term for training or instruction delivered over the internet or an intranet using a web browser
<b>LMS:</b>	A learning management system (LMS) is a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs.

### 4.34.1.3. PURPOSE OF THESE GUIDELINES

- A. Due to the continuous evolution of delivery methods of the training, the aviation training industry is currently experiencing a major shift to on-line learning and instruction, such as distance learning and virtual classroom instruction.
- B. Online teaching requires careful thinking about how students and instructors are equipped for the change and serious consideration about whether the teaching style is still effective when taken out from the classroom and transposed to or mixed with technological devices. Moreover, inequalities are exacerbated when it comes to access to technology and digital devices, as many students may lack the connections and devices to learn remotely.
- C. This document provides guidelines for conducting theoretical parts of the training according to the applicable training program/syllabus in a virtual classroom. To maintain

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high-quality standards of training, hands-on practical training will be conducted as per the applicable training program. The guidance material contained in this section may not be applied to any practical/ hands on training activity.

D. A reasonable balance between the different training methods should always be ensured so that the student achieves the level of proficiency necessary for the safe performance of all related duties and responsibilities. As an example, during cabin crew training numerous training elements are usually taught through a combination of theory and practice.

E. Some of the principles illustrated in these guidelines can also be applied to other remote learning methods, such as instructional videos (videotapes, DVD, USB sticks, etc.),

### **4.34.1.5. APPLICABILITY**

This section is applicable to all e-learning theoretical training conducted by any GACA regulated entity in compliance with the GACARs requirements.

A. The shift of training organization from physical/face to face teaching to distance learning in virtual classroom environment.

B. An increasing number of aviation training providers need to shift more of their theoretical knowledge instruction methodology to a remote or virtual environment to enable continuity of any planned training regardless of location or condition.

C. Different ways of learning and communicating are necessary to successfully enable the continuation of the required training to cope up with new technological changes.

D. There are two aspects of remote/virtual environment applicable to training that require careful consideration:

(1) Distance learning;

(2) Substitute (or complement) face-to-face classroom instruction by virtual classroom instruction.

E. When deciding to allow distance learning, if applicable, by virtual classroom instructions, GACA should require training providers to perform a risk assessment that, as a minimum, carefully evaluates whether:

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- (1) Students and theoretical knowledge instructors will have access to appropriate equipment to support remote learning/instruction or the shift from face-to-face to virtual classroom training;
- (2) The teaching style remains effective in achieving the training objectives;
- (3) The remote environment is able to reach each training objective.

F. Most traditional training delivery system can have virtual equivalents, such as:

- (1) A classroom can be physical or virtual;
- (2) Tutorials can also be e-tutorials;
- (3) Computer Based Training can also be made available online outside of the training provider's Facilities.
- (4) Demonstrations, supported by demonstration equipment where virtual reality technology can be applied;
- (5) Exercises carried out as groups or individuals and based on tasks such as pre-flight, enroute planning, communications, presentations, Aerodromes, heliports and projects may be online in a small virtual classroom;
- (6) The directed study including workbook exercises or assignments, is excellent for online Learning Management System use;
- (7) In aviation industry field trips, including aerodrome or aircraft visits, the instructor can present/ show the relevant portion by way of focusing the camera of the item which is to be taught, whilst students can have an online session (e.g., using Open Broadcaster Software) with the possibility of asking questions;
- (8) Distance learning by both methods synchronous and asynchronous are already in common use;
- (9) E-learning;
- (10) Mobile learning (M-learning);
- (11) Web-based learning.

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G. The training provider must include in its applicable training manual:

- (1) A detailed description of the distance learning technology to be utilized;
- (2) The procedures describing as to how the distance learning program will be administered;
- (3) A description of how the course contents will be delivered;
- (4) How the instructors and students will communicate with each other as and when needed;
- (5) The procedures to ensure that the distance learning course records are kept in compliance with the approved curriculum.

H. The change from the physical classroom to the virtual one along with the change management methodology used, requiring prior approval of the President.

### **4.34.1.7. DISTANCE LEARNING**

A. When using distance learning, there must be no change to the training course outlines other than the delivery method.

B. When using distance learning, due consideration should be given to students' evaluation. For this reason, after finishing the distance-learning course, the training provider should conduct the students' evaluation and analyze them to avoid any shortcoming in the online training.

C. During distance learning, the training progress (stage checks and end-of-course tests) needs to be monitored closely. This can be done by additional (online) quizzes and tests.

D. The checks conducted after completion of each stage as well as at the end of the course must be identical to the checks and tests that are normally administered in face-to-face classes. Each student will be given the test through a testing platform. The testing platform must ensure the integrity of the test, provide identification of the student, and is capable to maintain the confidentiality of the answers provided by the student, and also maintain the access control.

E. A GACA regulated entity proposing the implementation of distance learning should submit a request to the applicable GACA Aviation Standards Inspectorate requesting an

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approval for authorization to conduct distance learning.

F. The responsible GACA inspector should provide source references of distance learning program guidance to the training provider as requested. If the training provider has submitted a proposed distance learning program, the GACA Inspector must review the entire program for written policies, procedures, equipment sufficient to conduct distance learning, and the evaluation criteria prior to accord approval or authorization of the program. (Use table 4.34.1.25 e-learning Evaluation Checklist)

G. Approval of the training provider to utilize distance learning as a teaching delivery method does not alleviate the training provider from meeting all requirements of applicable GACARs. If the training provider does not meet the minimum requirements to support implementation of distance learning, the President will not approve the distance learning method of imparting training until such time that the program and its requirements are found to be satisfactory to the President.

H. The initial implementation and subsequent surveillance of a distance learning program requires written policy and procedures and, as a minimum, fulfil the following requirements:

(1) An LMS must consists of efficient and reliable hardware and software technology to accomplish comprehensive storage, handling, and tracking of all aspects of the distance learning program, including:

- Students online distance learning attendance tracking/recording.
- Students online distance learning participation tracking/recording.
- Students online distance learning performance measurement tracking/recording.

(2) The training provider must have the appropriate GACA Authorizations/Limitations, prior to conducting distance learning.

(3) The availability of the distance learning course list.

(4) GACA “read-only” access to the LMS (to facilitate surveillance).

(5) Report availability for analysis of distance learning test scores in comparison to traditional classroom test scores.

(6) Report availability for analysis of distance learning course completion times in

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comparison to traditional course completion times.

(7) The verification by the training provider that the distance learning courses combined with the traditional classroom teaching meet, as a minimum, the curriculum requirements as laid down by the related GACAR requirements.

I. Deficiencies observed within the distance learning program during surveillance must be identified and brought to the attention of the training provider for necessary correction. A training provider with approval to conduct distance learning must continually operate to meet the requirements of the approved distance learning program to enable continued approval / authorization to conduct distance learning.

### **4.34.1.9. VIRTUAL CLASSROOM INSTRUCTION - GENERAL**

A. Virtual classroom training should generally be considered as an accepted alternative to face-to- face classroom training in the context of training as required for modular and integrated courses. These guidelines provide further criteria for GACA inspectors to assess and accept arrangements for virtual classroom instructions.

B. The face-to-face classroom instruction delivered by an instructor may be replaced by virtual classroom instruction, such as videoconferencing, if an acceptable level of communication and interaction is ensured with appropriate equipment and tools. The virtual classroom instruction should provide real-time instructor-led learning where students can view, interact, communicate, discuss about their doubts in respect of the presentations. The training provider should also ensure that the students make satisfactory academic progress and maintain reliable records after the completion of the training.

C. These requirements should be in place which constitute a crucial part of the Compliance Monitoring System.

### **4.34.1.11. VIRTUAL CLASSROOM INSTRUCTION – LEVEL OF COMMUNICATION**

A. An acceptable level of communication should meet all of the following criteria:

- (1) Live interactive instructor-led sessions in an online learning environment within a shared online space;
- (2) Continuously maintain an active and simultaneous exchange between instructor

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- and student(s): dynamic and two-way flow of communication without delay;
- (3) Able to share relevant training material as specified for the appropriate lesson, unit or course in the training manual;
  - (4) Maintain a “video and audio” interactive communication by taking into account non-verbal communication cues (tone of voice, facial expression ...);
  - (5) Establish a policy for the use of the virtual classroom instructions such as “raise your hand, question, etc.”
  - (6) Monitor what the instructor’s screen displays;
  - (7) Ensure that students have tools to present learning content in different formats, as well as to implement collaborative and individual activities. The instructor should reincarnate the role of a moderator who guides the learning process and supports group activities and discussions.
- B. Virtual classroom instruction requires the students and the instructor to interact equally – active participation, collaborative work, and communication are encouraged in this mode of teaching. The instructor creates opportunities for independent learning and learning from one another, and guides the students in developing and practicing the skills they need.
- C. Doing this at the student’s own pace, as far as practicable, would enhance a student-centered training. This increases the motivation level of the students as well as their interest in the learning activities.

### **4.34.1.13. VIRTUAL CLASSROOM INSTRUCTION – APPROPRIATE EQUIPMENT AND TOOLS**

- A. The equipment and tools needed for the virtual classroom instruction should ensure an acceptable level of communication without technical interruption during the imparting of virtual classroom instructions.
- B. The equipment should ensure the students identification (visual when needed) and, a continuous assessment of the level of communication with all students.
- C. The equipment should permit the instructor to achieve the same training objectives and quality of instructions compared to the face-to-face classroom mode of instructions defined by

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the training provider.

D. Smart phones are not considered adequate for presenting videos and images, although they may be very effective for attending a lecture.

### **4.34.1.15. VIRTUAL CLASSROOM INSTRUCTION — INSTRUCTOR**

A. The training provider should ensure that the instructor who is delivering the virtual classroom instructions:

- (1) Has received appropriate training, covering at least learning style, teaching method associated with virtual classroom instruction, such as videoconferencing, and familiarization with the virtual classroom instruction;
- (2) Demonstrates his ability to manage time, training media, equipment and tool to ensure that the training objectives are met;
- (3) Performs any necessary assessment of the student(s) including proper identification of the assessed student.

B. During the course of the virtual classroom instruction, the students should be encouraged by the instructor to participate in the interaction at regular intervals. This can be achieved by a variety of activities such as brainstorming, small group discussion, collaborative and individual tasks, Q&A sessions, etc.

### **4.34.1.17. VIRTUAL CLASSROOM INSTRUCTION — STUDENT**

A. Creating positive learning environment, engaging students and encouraging active participation helps the students to achieve the learning objective.

B. During the virtual classroom instruction, there should be opportunities for frequent interaction between student and instructor, student and other students, and student and content. Instructions in a synchronous virtual classroom can only be successful with the active participation and engagement of the students. This creates a positive learning environment and helps the students achieve the expected outcomes.

### **4.34.1.19. VIRTUAL CLASSROOM INSTRUCTION — ACCEPTABLE LEVEL OF**

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### ACADEMIC EFFECTIVENESS

#### A. Maximum number of students and training times

- (1) The maximum number of students should be established considering the capability of the tool to maintain an acceptable level of communication and it should be adapted to the training objectives. Ideally, it should avoid exceeding a maximum number of 16 students.
- (2) Training design should take into account that students may find virtual classroom training more tiring than traditional classroom training and the daily training hours may therefore need to be reduced.
- (3) A break of reasonable time should be planned for every hour of virtual classroom instruction.

#### B. Attendance records

The instructor delivering the virtual classroom instruction should be responsible for the attendance records of the students by ensuring That the students participating in the virtual classroom training are mentally and physically attentive/present during all the virtual classroom sessions.

#### C. Interruption of connection, loss of communication

- (1) Interruption of connection and loss of communication amongst individual participants can happen during a virtual classroom session.
- (2) The training provider should develop a policy on the progress of such a session, repetition of instructed training element and re-involvement of participants affected by the temporary loss of connection.
- (3) Non-attendance should be managed in accordance with the “non-attendance” policy as in a face-to- face classroom instruction.

#### D. Examinations/Evaluations

When examination or evaluation is necessary in virtual classroom, positive identification of students should be assured. Oral exams or remote forms could be used, provided the system used is the same for all students.

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### **4.34.1.21. TRAINING SYSTEM FEEDBACK LOOP**

The training provider should ensure that:

- A. The participants report strengths and weaknesses of the training system (training environment, training program assessment and evaluation) and suggest improvements;
- B. The instructor keeps an effective time management;
- C. Discussions among classmates is facilitated;
- D. Feedback system for student is elicited.

### **4.34.1.23 Oversight by GACA**

GACA should have access to the virtual classrooms and sample the training. Intensified oversight recommended in particular, during the initial phase. GACA aviation inspector should use table 4.34.1.25 as a guide when evaluating an online or distance learning program.

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#### **4.34.1.25 e-learning Evaluation Checklist**

The following checklist is provided as a guide for reviewing a training program/course using distance learning methodology. Some suggested items may not be applicable to all training courses.

Training program/course:			
Training Provider:			
Certification Number:			
GACA Inspector:			
Inspection Date:			
Conduction Method:	Virtual	CBT	

CHECK	ITEM	INSPECTOR FINDING/COMMENTS
	<b>A. e-learning Risk Assessment</b>	
	Students and instructors have access to appropriate equipment to support remote e-learning/instruction? <b>4.34.1.5 (E.1)</b>	
	Whether this teaching style remain effective in achieving the training objectives? <b>4.34.1.5 (E.2)</b>	
	Whether the remote environment is able to achieve each training objective? <b>4.34.1.5 (E.3)</b>	
	<b>B. Training Manual</b>	
	Does the manual include a detailed description of the distance learning methodology and an appropriate Learning management system to be utilized? <b>4.34.1.5 (G)</b>	
	Does the manual include procedures describing as to how the distance learning program will be administered? <b>4.34.1.5 (G)</b>	
	Does the manual include a description of how the course content will be delivered? <b>4.34.1.5 (G)</b>	
	Does the Manual include description of how the instructors and students will communicate as and when needed? <b>4.34.1.5 (G)</b>	
	Does the Manual include procedures to maintain distance learning course records are in compliance with the approved curriculum? <b>4.34.1.5 (G)</b>	
	Does the manual include procedures for collecting evaluation of the students and analyzing them to avoid any shortcomings in the online training after finishing the distance-learning course? <b>4.34.1.7 (B)</b>	

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	<b>C. Learning Management System</b>	
	Does the LMS check the student progress after each stage using quizzes and end-of-course tests? <b>4.34.1.7 (C)</b>	
	Does the LMS provide the ability of identifying the student and maintain access control? <b>4.34.1.7 (D)</b>	
	Does LMS ensure the integrity of the test? <b>4.34.1.7 (D)</b>	
	Can LMS maintain the confidentiality of the answers provided by the student? <b>4.34.1.7 (D)</b>	
	Does the LMS have sufficient hardware and software technology to accomplish comprehensive storage, handling, and tracking all aspects of the distance learning program? <b>4.34.1.7 (H.1)</b>	
	<b>D.1. Virtual Classroom – Level of Communication</b>	
	Does the instruction take place in a Live interactive instructor-led session in an online learning environment within a shared online space? <b>4.34.1.11 (A.1)</b>	
	Is the Communication, dynamic with the two-way flow without delay? <b>4.34.1.11 (A.2)</b>	
	Can Instructor/students share relevant training material as specified for the appropriate lesson, unit, or course in the training manual? <b>4.34.1.11 (A.3)</b>	
	Can participants maintain a "video and audio" interactive communication by taking into account non-verbal communication cues (tone of voice, facial expression ...)? <b>4.34.1.11 (A.4)</b>	
	Is there a policy for the use of virtual classroom instructions such as "raise your hand, question, etc."? <b>4.34.1.11 (A.5)</b>	
	Can the student monitor what the instructor's screen displays? <b>4.34.1.11 (A.6)</b>	
	Do students have the tools to interact in group activities and demonstrate understanding? <b>4.34.1.11 (A.7)</b>	
	<b>D.2. Virtual Classroom – Appropriate Equipment and Tools</b>	
	Do Equipment and Tools provide an acceptable level of communication without technical interruption during the virtual classroom instructions? <b>4.34.1.13 (A)</b>	
	Do equipment and tools guarantee the students' identification (visual when needed) and, a continuous assessment of the level of communication with all students. <b>4.34.1.13 (B)</b>	
	Do equipment and tools permit the instructor to achieve the same training objectives and quality of instruction compared	

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	to instruction within face-to-face classroom? <b>4.34.1.13 (C)</b>	
	Does the instructor use a desktop PC or mobile to instruct online? <b>4.34.1.13 (D)</b>	
	<b>D.3. Virtual Classroom – Instructor</b>	
	Did the instructor receive appropriate training covering at least learning style, teaching method associated with virtual classroom instruction? <b>4.34.1.15 (A.1)</b>	
	Can the instructor demonstrate his ability to manage time, training media and equipment and tool to ensure that the training objectives are met? <b>4.34.1.15 (A.2)</b>	
	Does the instructor perform any necessary assessment of the student(s) including proper identification of the students? <b>4.34.1.15 (A.3)</b>	
	Does the instructor encourage students' participation through brainstorming, small group discussion, etc.? <b>4.34.1.15 (B)</b>	
	<b>D.4. Virtual Classroom – Student</b>	
	Is the student encouraged and motivated? <b>4.34.1.17 (A)</b>	
	Does the student have the opportunities for frequent interaction between student and instructor, student and other students, and student and content? <b>4.34.1.17 (B)</b>	
	<b>D.4. Virtual Classroom - Acceptable Level of Academic Effectiveness</b>	
	Is the maximum number of students in a training session limited to 16? <b>4.34.1.19 (A.1)</b>	
	Are the daily training hours reduced to take into account that students may find virtual classroom training more tiring than traditional classroom training? <b>4.34.1.19 (A.2)</b>	
	Is there a reasonable break time planned for every hour of virtual classroom instruction? <b>4.34.1.19 (A.3)</b>	
	Is the instructor conducting the class responsible for the attendance records? <b>4.34.1.19 (B)</b>	
	Is non-attendance managed in accordance with the "non-attendance" policy as in a face-to- face classroom instruction? <b>4.34.1.19 (C.3)</b>	
	Is there a positive identification of students during testing? <b>4.34.1.19 (D)</b>	
	<b>E. Student Based e-learning using CBT</b>	
	Does the CBT provide enough training contents to achieve all the training objectives? <b>4.34.1.5 (E.3)</b>	
	Does the CBT provide the ability of identifying the student	

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	and maintaining access control? <b>4.34.1.7 (D)</b>	
	Does the CBT include quizzes to track the student learning progress? <b>4.34.1.7 (C)</b>	
	How is this CBT training event added to the student training record? <b>4.34.1.5 (G)</b>	
	<b>F. Training System Feedback</b>	
	Is there a system for evaluation by the students after completion of the <u>online training program</u> ? <b>4.34.1.21</b>	
	Does the evaluation form allow the participant to report strengths and weaknesses of the training system (training environment, training program assessment, and evaluation) and suggest improvements? <b>4.34.1.21 (A)</b>	
	Does the organization have a system to analyze the evaluations and take necessary actions for improvement? <b>4.34.1.21 (D)</b>	