1. FOREWORD

The OPC Questionnaires is under the responsibility of Thai Airways International Public Company Limited. The content and issuance of this booklet is under the Flight Deck Crew Training (PB-B). Flight Deck Crew Training also takes care of the publishing and distribution. It is the responsibility of each pilot within THAI to know their contents.

2. PURPOSE AND SCOPE

The purpose of this booklet is to provide THAI pilots and instructors with the guidelines for reviewing of general Company procedures laid down in OM-A, RM or other flight manuals. It shall also be used as questionnaires for the checking of pilot knowledge during Recurrent Training.

A random of 20 questions will be chosen from OPC Questionnaires and additional 5 questions from PBN questionnaires. The minimum passing grade is 75%.

They do not cover all aspect of the Flight Operations nor will they be revised on a regular basis, therefore, the information may be out dated. Please refer to Company's manuals and Route Manual for correct regulations, procedures and operational policies.

Any questions with respect to information contained herein should be directed to Flight Deck Crew Training (PB-B)

Bangkok, 16 OCT 2021

THAI AIRWAYS INTERNATIONAL PUBLIC COMPANY LIMITED

Flight Deck Crew Training (PB-B)

1. What does the word “Shall”, “Should”, “May” in OM-A mean?

(OM- A 0.1.5)

Terms Used

When used in OM-A, the terms below shall have the following meaning:

- "Shall", an action verb in the imperative sense, means that the application of a rule or procedure or provision is mandatory.
- "Should" means that the application of a procedure or provision is recommended.
- "May" means that the application of a procedure or provision is optional.

2. How to use of flight and voice recorders in case of accident or major incident?

(OM- A 2.1.3.5)

Cockpit Voice Recorder Data

Cockpit voice recorder data may not be used for purpose other than for the investigation of an accident or incident except where the recordings or transcripts are:

- related to a safety-related event identified in the context of a safety management system, restricted to the relevant portions of a de-identified transcript of the recording and subject to the protections accorded by Annex 19
- sought for use in criminal proceedings not related to an event involving an accident or incident investigation and subject to the protections accorded by Annex 19, or
- used for inspections of flight recorder systems.

Cockpit Voice Recorder is not intentionally switched off, unless required to preserve CVR data after an accident or serious incident.

The recorders are primarily intended for accident investigation and shall be operated according to the relevant instructions in FCOM. The continuous operation of the recorders in flight must not be interrupted.

Flight and voice recorder information may only be used in connection with investigations of an accident/incident.

In the event of an occurrence of a serious nature (accident or major incident), the P-i-C shall ensure that both the flight recorder and the voice recorder be removed and secured for the subsequent investigation. Permission to use the recorded data can only be given by DO.

Note: The voice recorder will normally continue to run after parking. To preserve the recording during accident/incident, it is necessary to pull its circuit breaker immediately after parking.

Whenever the accident/serious incident occurred, the P-i-C shall enter the complaint in the Aircraft Technical Logbook, stated that: “Remove and secure flight data recorder and/or cockpit voice recorder for subsequent investigation.”

The P-i-C shall coordinate with the station engineer to be assured that flight/voice recorders have been preserved and secured.

3. What are the DO Safety-Security-Quality Statement and objectives?

(OM-A 3.1.3)

- In addition to the corporate safety and compliance policy is complemented by the following policy items related to the Operations Department:
- All of our flights shall be operated with safety as the top priority, followed by punctuality and other services in accordance with their relative importance to customer satisfaction. We therefore adopt a cost-effective strategy with the goal of maximizing safety.
- All processes shall be performed by competent personnel and controlled by professional management according to the established procedures in the manual.
- All Flight Deck Crew, Cabin Crew, Dispatch, and all other personnel who perform operational functions critical to the safety of aircraft operations to be physically and medically fit for duty.
- All staff has to submit safety report and/ or human error in which they are personally involved, or that they become aware of.
- Safety and compliance (quality) is everyone's responsibility.
- Continually improving safety performance and conducting safety management review to ensure relevant safety action is taken effective.
- A review of Flight Operations Policy takes place regularly to ensure continual improvement.
- There are 5 objectives:

  - **S: Safety, Security and Compliance**
    - Safety shall never be compromised.
    - Utmost precautions shall be taken to avoid contact with all acts of hostilities.
    - Safety and compliance shall be integral and core elements of every process in Operations Department.
  - **P: Punctuality**
    - On-time performance (OTP) is used to measure punctuality.
    - Definition of on-time performance, or OTP, is flights that arrive or depart within 15 minutes of their scheduled times.
  - **P: Passenger comfort and customer satisfaction**
    - A number of completed flights according to the agreed TPI is the main product of Operations Department (DO). All our flights shall meet the expectations of our customers.
  - **E: Economy**
    - To carry out all flights with regards to safety economy and efficiency base of the latest weather forecast, NOTAM, AIP and regulations including irregularities.
    - Our economy and efficiency performance shall be continuously monitored, analyzed, and improved.
  - **Employee pride of being THAI**
    - All employees shall be given reason to feel proud of being valuable members of strong Operations Team of DO.

4. State some example of factors which are common hazard source in aviation.

(OM- A 3.4.9)

The following factors listed in ICAO Doc 9859 Safety Management Manual are of common hazard sources in aviation:

- design factors, including equipment and task design
- human performance limitations (e.g. physiological, psychological and cognitive)
- human-machine interface factors
- procedures and operating practices, including documentation and checklists
- communications, including the medium, terminology and language
- factors related to the operational environment of the aviation system (e.g. ambient noise and vibration, temperature, lighting and the availability of protective equipment and clothing)
- organizational factors, such as the compatibility of production and safety goals, the allocation of resources, training, recruitment, operating pressures and the corporate safety culture
- work environment factors, such as ambient noise and vibration, temperature, lighting and the availability of protective equipment and clothing
- regulatory oversight factors, including the applicability and enforceability of regulations; the certification of equipment, personnel and procedures; and the adequacy of surveillance audits
- defenses, including such factors as the provision of adequate detection and warning systems, the error tolerance of equipment and the extent to which the equipment is hardened against failures.

5. According to the Method for determining Crew composition, could you explain the Relief of flight crew member.

(OM- A 4.1.2.1)

Relief of Flight Crew Member

During takeoff, climb, descent, approach and landing, the pilot seats shall be occupied by the pilots. Flight crew member must not leave his station without permission from the P-i-C. For a short period, one of the minimum numbers of flight crew members may be permitted to leave the flight deck for toilet visit or for safety reasons, however the remaining flight crew shall continuously maintain unobstructed access to the flight controls, alertness and situational awareness.

A flight crew member may be relieved in flight of his duties at the controls by another suitably qualified flight crew member.

A flight crew member shall not vacate an aircraft control seat below FL 200 for the purpose of transferring duties to another flight crew member.

Relief of the P-i-C

The P-i-C may delegate conduct of the flight to a pilot qualified as detailed below.
Minimum requirements for a pilot relieving the P-i-C:

- valid Airline Transport Pilot Licence
- type Rating
- valid PPC (Pilot Proficiency Check)
- route qualification.

Relief of the Co-pilot

Above FL 200, the co-pilot may be relieved by another suitably qualified pilot or a cruise relief co-pilot with the following qualifications:

- valid Commercial, Multi-crew or Airline Transport Pilot Licence with Instrument Rating
- standard Type Rating/Transition Training or Type Rating Training for cruise pilot duty
- valid PPC (Pilot Proficiency Check).

Captain candidates who are promoted on the same type of aircraft or pilots after a satisfactory Relief Pilot Release Check may occasionally be scheduled during their Route Introduction as relief co-pilots on revenue flights with line captains.

6. When are Cabin Attendants not required on flight with passengers? and What is the minimum number of cabin attendants for your aircraft type?

(OM- A 4.1.3.1)

Minimum Number of Required Cabin Crew

Required cabin crew serving on a flight in the interest of safety of passengers, shall be qualified according to qualification requirements of cabin crew. Refer to CCM01 1.6—Qualification Requirements of Cabin Crew.

The minimum number of required cabin crew is linked to the approved passenger seating capacity of the configuration, for a safe and expeditious evacuation of the airplane.

- One required cabin crew member for every 50, or fraction of 50, passenger seats installed on the same deck of the aircraft.
- The minimum number of required cabin crew of each aircraft type shall not less than the number of main emergency exit door (floor level exit) of each aircraft type.
- Required cabin crew shall be located near required floor level exits and be uniformly distributed throughout the cabin.

In order to cover the established emergency procedures, the minimum of number of required cabin crew on each aircraft type shall not be less than that seated in the table below. (See OM-A 4.1.3.2—Reduced Minimum Number of Required Cabin Crew).

Minimum Cabin Crew

Aircraft Type	Cabin Version	Seating Capacity	Total Minimum Number of Required Cabin Crew
747-400	7444	375	11
	7445	374	11
777-200ER	77E1	292	8
777-300ER	77B1	348	10
787-8	7872	256	8
787-9	7891	298	8
A350-900	3591	321	8
A380-800	3801	507	18

1. In exceptional cases, a flight may be operated with the minimum number of cabin crew as stated in the respective FCOM/CCM, provided the conditions for such operation are adhered to.
2. Cabin crew station to be occupied on each aircraft type, refer to CCM 1.8.2—Cabin Crew Assigned Station.
3. Regarding requirements for cabin composition when transporting physically handicapped passengers, Refer to the respective FCOM.
4. Cabin crew are not required on the following flights:
   - test flights
   - functional check flights
   - base training flights
   - delivery flights
   - customer acceptance or demonstration flights
   - flights conducted under a Ferry Flight Authorization
   - flights conducted under a Permit to Fly (note that additional conditions relating to cabin crew may be imposed in the Permit to Fly)
   - any other flights approved by the Authority
   - flight with only supernumeraries who have been briefed according to OM-A 8.3.16 - Passenger Briefing Procedure to ensure a sufficient knowledge about safety and security of flight
   - flight with only flight crew members regardless of number. P-i-C shall delegate safety duties to the selected flight crew, such as arming and disarming of passenger doors.
5. For flight described in Note 4. All persons carried on board shall be briefed on safety, emergency and evacuation procedures. In addition, where more than 19 persons are carried on board (excluding the flight crew), the minimum number of cabin crew shall be required to affect a safe and expeditious evacuation of the aircraft. (One cabin crew for every 50, or fraction of 50).
6. One cabin crew is required on the 747-400 upper deck during taxi, takeoff, and landing. This cabin crew should be responsible for communicating with the flight deck crew in the event of any emergency on takeoff or landing; and emergency evacuation procedures should require CIC to remain at his or her station and to control and operate the emergency exits.

7. Which seat shall the Captain acting as a PF during takeoff and landing occupy if there are two Captains occupying pilot seats?
What is the P-i-C's duties in case of an emergency/malfunction during takeoff when he is seated in RH seat?
(OM-A 4.2)

Two Captains Occupying Pilot Seats
When two captains qualified on the aircraft type concerned occupy the pilot seats, the captain designated as P-i-C may occupy either the left or the right pilot seat. The captain acting as PF during takeoff and landing shall normally occupy the left pilot seat. However, an instructor, Line Check pilot or Captain who is currently qualified on the RH seat may perform PF's duty from the right pilot seat.

Note: The loadsheet shall be signed by the P-i-C.

P-i-C Seated in RH Seat

During normal operation, the P-i-C shall perform the duties of PF or PM/PNF as applicable.
The P-i-C shall initiate all actions required in case of an emergency. If he deems it necessary to take over the maneuvering of the aircraft, he shall call out "My controls" or "I have controls".

In case of emergency/malfunction during takeoff roll, he shall order "Stop" or "Go".

- "Stop" indicates his decision to reject the takeoff. Thereafter, he shall perform the checklist items pertaining to RP.
- "Go" indicates his decision to continue the takeoff. The pilot acting as PF shall continue to maneuver the aircraft.

Emergency evacuation shall be called by P-i-C, but he shall perform checklist items as RP. When Emergency Evacuation Checklist is completed, he shall resume the duties as P-i-C during evacuation. The other pilot occupying LH seat shall perform the duties as co-pilot during evacuation.

8. Which age the captain is entitled to perform flight duty as a P-i-C?

(OM- A 4.2.6)

The Captain, over 60 years of age, is entitled to perform flight duty as a P-i-C until 65.

9. Who shall assume the P-i-C duties should he become incapable of holding command?

(OM-A 4.3)

Succession of Command

Succession of command in case of incapacitation of the P-i-C is as follows:

- Flight crew composed of two pilots:
  the second pilot takes the authority over all persons on board the aircraft until the normal chain of command can be re-established.
- Flight crew composed of more than two pilots:
  the second pilot takes the authority over all persons on board the aircraft until a more qualified pilot (if any) takes the authority after having been informed by the second pilot and having acknowledged the overall situation and this until the normal chain of command can be re-established.
  If the original P-i-C cannot continue his command of the flight, the flight will not depart from the aerodrome where it has landed or, if occurring in flight, from the next aerodrome at which it lands, unless another P-i-C on that particular type of aircraft is included in the crew list.

10. State the initial qualification for CAT II/III during conversion to a new aircraft type?

(OM- A 5.2.14.1)

All Weather Operations (AWO)

CAT II/III Qualification Requirements

To be qualified before conducting CAT II or III operations, flight crew members shall undertake the appropriate training as follows:

- Flight crew members with no CAT II or CAT III experience must complete the full training program.

- Flight crew members with CAT II or CAT III experience (Conversion) may require undertaking the following:
  - abbreviated ground training, and
  - simulator training—At least successful completion of 8 approaches and/or landing, or

- flight training—Where no type-specific simulator is available, at least successful completion of 3 approaches including at least 1 go-around is required on the aircraft.

- Following the simulator or flight training, Route Introduction (RI) or Line Flying Under Supervision (LIFUS) must be flown simulated according to the listed number of landings given below:
  - for CAT II—When a manual landing is required, a minimum of 3 landing from autopilot disconnect. For aircraft certified for an auto land, this requirement is disregarded
  - for CAT III—A minimum of 3 auto lands, except that only 1 auto land is required when the Simulator training or Flight training above has been carried out.

Note: Simulated CAT II/III shall be carried out when actual weather report is at or above CAT I minima.

Aircraft Recency Requirements

To maintain CAT II/III qualification current, each crew member is required to have completed one CAT II and/or CAT III approach and landing as appropriate in the aircraft in a six-month period. This may be satisfied by conducting practice in good weather conditions.

11. What is the Route Qualification requirements for P-i-C? (OM-A 5.2.15.3)

Route Qualification Requirement

Depending on the complexity of the routes, the methods of familiarization to attain route qualification are as follows:

● less complex routes

Self-briefing with routes documentation or by means of programmed instruction is considered to be qualified for such route.

● more complex routes

To be qualified for flight operations on “more complex routes” stated in Route Classification above, the P-i-C shall have his in-flight familiarization under supervision, or have familiarized in an approved simulator using the database appropriate to the route concerned.

12. What are the Route and Aerodrome Qualification requirements for co-pilots?

(OM- A 5.2.15.1)

Route and Aerodrome Qualification

A pilot shall have adequate knowledge of the route and aerodrome to be flown before serving as the P-i-C on such route and aerodrome.

General, there is no qualification for Co-pilot. However, classroom or self-briefing is strongly recommended for more complex routes and Category B and C aerodromes.

Route and aerodrome competence qualification shall be revalidated by operating on a route in the group or to an aerodrome in the group within the period of validity.

Change of aircraft type requires no requalification regarding Route and Aerodrome Qualification.

Deviations from the following regulations may be approved by DP.

13. What are the Aerodrome Qualification requirements for P-i-C?

(OM-A 5.2.15.4)

Aerodrome Qualification Requirements

The aerodrome familiarization requirements for the P-i-C to attain aerodrome qualification of each aerodrome Category are as follows:

- Category A
  no requirement.
- Category B
  The flight crew shall be qualified by:
  - self-briefing, or
  - classroom briefing
- Category C
  The flight crew shall be qualified by:
  - classroom or self-briefing, and
  - training in a flight simulator or perform a flight duty to the aerodrome as an observer, a co-pilot or under supervision.

Exception

The requirements for special airport qualification (USA only) will not be applied if ceiling for such airport is at least 1,000 ft above the lowest MEA or MOCA, or initial approach altitude prescribed for the instrument approach procedure, and the visibility is at least 3 SM.

In exceptional circumstances, a P-i-C, without qualification or with the previous experience on a particular route or aerodrome that exceeds 12 months, may be allowed to operate to a more complex route or a Category C aerodrome during daylight operation or with co-pilot who has been on the aircraft type for at least 1 year and has recent experience of the particular route or aerodrome within 60 days with the following requirements:

- the P-i-C shall be briefed by a qualified personnel, classroom or self-briefing, and
- 200 ft./1,000 m. shall be added to the aerodrome landing minima, and
- LVO is not expected a the aerodrome, and
- an approval shall be requested by PA or Team Lead of (PB-B Team 1/2) and authorized by DP.

See OM-A 8.1.2.3—Aerodrome Category and Requirements.

Means of Qualification

Qualification to each route and aerodrome may be achieved by one or more of the following means depending on the category of such route and aerodrome:

- self-briefing by THAI route and aerodrome pictorial briefing documents, audio- visual programmed instruction or e-learning
- classroom briefing by qualified personnel
- flight simulator training approved by the authority for this purpose
- perform flight duty as an observer, a co-pilot or under supervision.

14. While on duty, how shall any crew member who become ill or incapacitated do?

(OM- A 6.1.1.2)

Illness or Incapacitation While on Duty

The P-i-C has the overall responsibility for ensuring that all of the crew is fit for duty, even if a report of sickness is not received.

Where any doubt exists, the P-i-C must ensure that the individual concerned is seen by a doctor and that the report from that doctor is forwarded to the main base, if possible this should be accomplished on the flight concerned, failing this, at the earliest opportunity.

In the case of the P-i-C being incapacitated, the normal devolution of command to the First Officer applies.

For procedures to be followed in case of crew member incapacitation, see OM-A 8.3.14— Incapacitation of Crew Members.

Any crew member who becomes ill or incapacitated while on flight duty or during a stop–over period at an outstation must report the matter to the P-i-C at the earliest opportunity.

P-i-C should be aware that a sudden deterioration in health might be an indication of the onset of a dangerous or infectious complaint.

Carriage of a flight crew or cabin crew member who is ill is not authorized without permission from the THAI medical department.

Carriage of an ill crew member could prejudice the Company's position in several ways:

- international health regulations
- liability to the staff member concerned, should a serious illness ensue
- invalidation of the insurance of the aircraft.

The P-i-C must ensure that a doctor is called at the earliest opportunity to examine the crew member concerned.
The P-i-C shall ensure a certificate must be obtained stating whether the concerned individual is fit for duty, or alternatively for travel.
The P-i-C is authorized to arrange any tests necessary to ascertain the condition of the individual concerned.
A written report must be submitted by the P-i-C and the ill or incapacitated crew member as soon as practicable after return to the main base.
The P-i-C should arrange notification of the Medical Department about the arrival time of the concerned crew member at the main base.
Crew members who are unable to perform their duties on account of illness or incapacitation shall report the case to the Crew Movement Operation (OP-1), or when on flight duty/at Line Station, shall report to the P-i-C.
Illness shall be reported as soon as possible, even outside flight duty period. If possible, expected duration of the illness shall be provided. The Crew Coordination Department shall be continuously informed if the duration of the illness is prolonged.
For flight crew, any illness that results in the suspension of pilot license shall be reported to the respective PA fleet.

After Sick Leave Report (Flight Crew)
A flight crew member who has been absent from flight duty due to illness or injury or whose absence of shorter duration is presumed to affect his license, shall not resume flight duty until he has been released by the Institute of Aviation Medicine (RTAF) or by CAAT Authorized Medical Examiner (AME).

When that flight crew has been released for flight duty, it is his duty to report this immediately to the Crew Movement Operation (OP-1),

15. How much blood alcohol level that crew member must not commence a flight duty? (OM-A 6.1.2)

Alcohol and Other Intoxicating Liquor

Performing any duties for THAI while under the influence of alcohol is strictly forbidden. No alcohol of any type shall be consumed while in uniform in public places or during travel duty as non-operating crew member (Deadhead, Positioning).

Crew members must not commence a flight duty period with a blood alcohol level in excess of 0.0 grams per liter.

Under no circumstances may any crew member consume alcohol in any form or quantity within 12 hours of commencing flight duty or standby until the end of the flight duty or standby. A 24-hour period between the last drink and takeoff time is recommended.

It is the duty of all crew members to warn their colleagues to always comply with the alcohol restrictions.

16. How do coffee and especially black coffee effects when the relative humidity of cabin air is much lower in flight? (OM- A 6.1.14.5)

Dry Air

The relative humidity of cabin air is much lower in flight than that to which humans are accustomed. Coffee and especially black coffee, being a diuretic (kidney stimulant) can exacerbate the effects of reduced humidity.

Symptoms resulting from low humidity are dryness of the nose, mouth and throat and general tiredness.

17. When flying in Rain, in addition to poor visibility, there may be a refraction error, what could be the result of such occurrence?
(OM-A 6.4.13)

Flight in Rain

In addition to the poor visibility when flying in rain, there is a refraction error in vision which causes the eyes to indicate a false horizon below the true one.

The reduced windshield transparency and the deflection of the light waves due to water patterns will, to the pilot, cause objects to appear lower than they actually are.

This error can be as high as 5°, which at a distance of one mile is 200 ft.
This danger is the greatest on an approach after becoming contact below clouds. It is, therefore, vitally important to cross-check the altimeter in such conditions.

18. What can be expected in your visual perception when descending into shallow fog?
(OM- A 6.4.15)

Descent into Shallow Fog

It has been shown that the sudden reduction in visual range on entering shallow fog during the final stages of an approach may be misinterpreted by the pilot that the nose of his aircraft is raising.

Pilots unfamiliar with this phenomenon will, therefore, tend to steepen their angle of descent when they encounter this situation, resulting in too high sink rate.

19. What is the minimum rest period?

(OM-A 7.2.4)

Rest Requirements
Minimum Rest Before undertaking a FDP

The minimum rest, which must be provided before undertaking a FDP, shall be at least as long as the preceding DP as prescribed in the following table:

Minimum rest period

Duty period	Minimum rest period
Not exceeding 8 hours	8 hours
Exceeding 8 but not exceeding 10 hours	10 hours
Exceeding 10 but not exceeding 12 hours	12 hours
Exceeding 12 but not exceeding 14 hours	14 hours
Exceeding 14 but not exceeding 16 hours	16 hours
Exceeding 16 but not exceeding 20 hours *(not exceeding 23 hours in case of unforeseen circumstances)*	24 hours
Note: 1. If the FDP comprise of at least one sector as specified in the flight schedule more than 9 hours (8 hours if the FDP finished or are in the period of 02:00 and 05:59 local time at departure aerodrome) the minimum rest shall be at least 18 hours. 2. According to the nature of operation and Fatigue management, THAI define minimum rest period base on preceding duty period.	

20. What is the allowable flight duty periods that a flight may be planned to be completed within? When will extra flight crew be required?

(OM- A 7.2.2)

Allowable Flight Duty Periods (FDP)

The allowable flight duty periods depending on the periods of starts of FDP's and the number of landings are given in the following Table.

Allowable FDP's for crew member

Local time of FDP start	The allowable flight duty period							
	Sectors							
	1	2	3	4	5	6	7	8>
06:00–07:59	13	12:15	11:45	11:15	10:45	9:45	9	9
08:00–14:59	13:30	13:15	12:30	11:45	11:15	10:45	9:30	9
15:00–21:59	13	12:15	11:30	10:45	10	9:15	9	9
22:00–05:59	11	10:15	9:30	9	9	9	9	9

***Note**: If the FDP comprise of at least one sector as specified in the flight schedule more than 9 hours (8 hours if the FDP finished or are in the period of 02:00 and 05:59 local time at departure aerodrome)shall have at least 1 augmented pilot.*

21. How many block hours may crew member fly as an operating crew member in one calendar year?

(OM-A 7.2.3)

Cumulative Flight Times

The cumulative flight times of the flights on which an individual crew member is assigned as an operating crew member shall not exceed:

- 34 cumulative flight hours in any 7 consecutive days
- 110 cumulative flight hours in any 28 consecutive days

Flight deck crew shall not exceed:

- 1,000 cumulative flight hours in any 365 consecutive days spread as evenly as practicable throughout the year

The cumulative flight time for each flight crew member of an augmented flight crew shall be as follows:

- 80% of the flight time, when augmented by 1 flight crew member
- 75% of the flight time, when augmented by 2 flight crew members
- 70% of the flight time, when augmented by 3 flight crew members

The cumulative flight time for each cabin crew member shall be as follows:

- 80% of the flight time for a flight sector with more than 8 hour flight time
- 75% of the flight time for a flight sector with more than 10 hour flight time
- 70% of the flight time for a flight sector with more than 12 hour flight time

Note: The cumulative flight time for each crew member shall be used for record keeping by DP-A and OP-1 with regard to the limitation of the flight time only. For other functions in THAI, 100% of the flight time is cumulative.

22. What is the maximum standby period?

(OM-A 7.2.3)

The standby limits 12 hours in each 24 hours.

- The accumulative continuous waiting time shall be maximum 72 hours with at least 24 hours rest period before undertaking a FDP.
- Suitable accommodation shall be provided, if a crew member is required to be on airport standby.

23. How long does the FDP extension for Flight Crew and Cabin Crew when the augmented crew provided?

(OM- A 7.3)

FDP Extension for Flight Deck Crew

- For two pilot crew augmented by 1 pilot, the maximum FDPs irrespective of encroachment of the WOCL are:
  - 14 hours with the provision of an adequate rest facility
  - 16 hours with the provision of a suitable rest facility.
- For two pilot crew augmented by 2 pilots, the maximum FDPs irrespective of encroachment of the WOCL are:
  - 16 hours with the provision of an adequate rest facility
  - 20 hours with the provision of a suitable rest facility.

- In all cases, where the flight crew are augmented, the sharing of time away from task by flight crew members leaving their posts should be kept in balance.
- Any flight that requires augmented flight crew should have at least 2 pilots holding Airline Transport Pilot License (ATPL) with at least one occupying the seat as qualified at all times.

FDP Extension for Cabin Crew

Irrespective of the periods of the starts of FDPs, the allowable flight duty period for cabin crew as prescribed in the table in OM-A 7.2.2—Flight Duty Periods (FDP) may be increased as shown in the table below provided that:

- each cabin crew member is relieved of all tasks during a part of the flight
- for all of the above conditions, the division of duty and rest is kept in balance between all of the cabin crew.

Maximum FDP's after extension for cabin crew

Hours of rest for each cabin crew member	Max hours of FDP's after extension	
	With adequate rest facility	With suitable rest facility
00:00–01:59	No extension	No extension
02:00–02:59	Up to 14:00	Up to 16:00
03:00–03:59	Up to 16:00	Up to 18:00
04:00 up	Up to 18:00	Up to 20:00

24. How can we deal with the unforeseen circumstances in actual flight operations ?

(OM- A 7.3.4)

Unforeseen Circumstances in Actual Flight Operations

- Flight delays and disruptions may occasionally cause the flight departure to be outside the permitted departure window. In such situations, the flight may be permitted to continue provided the flight and cabin crew FDP Limits have been analyzed to cater to the requirements for the amended departure time.
- Flight duty periods may be extended in such unforeseen operational circumstances by no more than 3 hours, only at the discretion of the pilot-in-command. Before exercising this discretion, the pilot-in-command shall be satisfied that all members of the crew required to operate the aircraft consider themselves fit to do so. This extension of the FDP may be carried out provided:
  - the safety of the flight will not be prejudiced
  - the extended FDP does not extend the FDP by more than three hours except in an emergency (escape/evacuation flight)
  - the rest period may be reduced but never below the minimum rest prescribed in the table in OM-A 7.2.4—Rest Requirements.
- in case of special circumstances, which could lead to severe fatigue, and after consultation with the crew members affected, the P-i-C shall reduce the actual flight duty time and/or increase the rest time in order to eliminate any detrimental effect on flight safety

- the P-i-C shall submit a report to the Director, Pilot Management Function (PA), whenever a FDP is increased or a rest period is reduced
- the report shall include date, time, aircraft, crew, details of planned and achieved schedules, detail of mutual agreement and the circumstances
- a copy of the report mentioned above shall be sent to CAAT no later than 14 days after the event
- PA shall separately retain all P-i-Cs discretion reports of extended FDP, at least 6 months after the event
- if discretion has to be applied for similar reasons on more than 33 percent of the flight in TPI when a particular route or route pattern is flown, it is likely that the intention of this fatigue management requirement is not being met. Arrangements shall be made to review the schedule or the crewing management so as to reduce the frequency of these events.

25. What is the minimum turning altitude after takeoff?

(OM-A 8.1.1.2.1)

Minimum Turning Altitude

All-engine turns shall not be initiated below 500 ft AGL except where clearly published in the SID or climb-out procedures.

26. What is minimum terrain clearance in case of engine failure?

(OM- A 8.3.2.1)

Routes and Areas of Operation

Operations shall only be conducted within routes and areas, for which:

- ground facilities and services are adequate for the type of aircraft operated
- meteorological services are adequate for the planned operation
- the performance of the aircraft used complies with MORA/MOCA/MEA and ATS altitude requirements
- the performance of the aircraft used complies with relevant airport runway requirements
- the performance of the aircraft used complies with relevant airport climb gradient requirements for both departure and missed approach
- the performance of the aircraft meets **Minimum Terrain Clearance** in Case of Engine Failure that the one-engine inoperative service ceiling is 1,000ft higher than the relevant terrain
- the performance of the aircraft meets a 2,000ft vertical clearance between the net drift-down flight path and the terrain at the Pre-Determined Point (PDP) in Case of Engine Failure using drift-down procedure
- the equipment of the aircraft intended used meets the minimum navigation requirements for the planned routing
- appropriate maps and charts are available
- for two-engine aircraft, adequate airports are available within the time/distance limitations
- operations shall be conducted in accordance with any restriction on the routes or the areas of operation, imposed by the CAAT
- company minima are observed as per Route Manual, LAT and NAV part.

27. What are the corrections for Wind, Temperature and QNH for all Minimum Flight Altitudes?

(OM-A 8.1.1.3)

Minimum Flight Altitude Corrections

All minimum the VFR and IFR Altitude Requirements stated above shall be corrected for wind and temperature when the altimeter is set to QNH and for wind, temperature and QNH when the altimeter is set to standard.

Wind Correction

The combination of strong winds and mountainous terrain may cause local changes in atmospheric pressure. P-i-C should make the correction for wind by using guidance table of altimeter errors below:

Altimeter error due to wind speed (ICAO doc 8168 table III 1-4-5)

Wind speed (kt)	Altimeter error (ft)
20	53
40	201
60	455
80	812

Corrections for wind speed should be applied in addition to the standard correction for pressure and temperature, and ATC should be advised.

Temperature Correction

For temperature, see the temperature conversion table in OM-A 8.3.3 to calculate correction or add 4% per 10° Celsius below standard as a rule of thumb.

Pressure Correction

For QNH below 1013.25 hPa, add 30 ft per hPa.

28. How shall we determine which aerodrome to be utilized?

(OM- A 8.1.2.1)

Usability of Airport

Before an aerodrome can be used for operations, approval by DO is required.

As a general policy, flight operations are permitted only to aerodromes that meet aircraft performance and THAI's requirements using standard operating procedures for the aircraft type concerned. Aerodromes that are approved for THAI's flight operations are listed in SAI 1.1—THAI Route Net Aerodrome List.

All departure, destination and alternate aerodromes considered for operations must be adequate for the type of aircraft and operation concerned. See OM-A 8.1.2.2—Airport Classification.

Under certain conditions, flights may be planned to aerodromes that are not listed if they are approved by DO after proper risk assessments. In addition, during an emergency situation, the P-i-C may decide to divert to any aerodrome that he considers appropriate.

29. Define the Airport classification.

(OM-A 8.1.2.2)

Airport classification	Classification criteria	Remarks
Adequate airport	An airport which is assessed and considered satisfactory on the following criteria: ● performance requirements for concerned aircraft type ● runway characteristics ● airport is equipped with the necessary ancillary services ● SAR and fire fighting category ● ATS and facilities ● weather reporting ● communication ● lighting ● ramp handling facilities ● navigation aids ● at least one let down aid.	For international flights, police, custom and immigration services are available at the expected time of use. Political aspects which might affect operation should also be considered.
Suitable Airport	An adequate airport which, at the time of intended landing: ● weather conditions are likely to be at or above operating minima and ● runway condition reports indicate that a safe landing can be accomplished.	
Emergency Airport	An airport which provides a good chance of successful landing in case of severe malfunction. ● No margins regarding aircraft performance are required.	Aerodrome data should be available in the FMS database.

30. What is qualification of P-i-C to operating the group C aerodrome?

(OM-A 8.1.2.3)

Aerodrome Category

Aerodrome Category	Criteria	Requirements & Remarks
Category A	● An approved instrument approach procedure. ● At least one runway with no performance limited procedure for takeoff and/or landing. ● Published circling minima not higher than 1,000 feet above aerodrome elevation.[a)] ● Night operations capability.	There is no qualification requirement for Category A aerodromes. All aerodromes within THAI route net, except those stated in Category B & C, are categorized as "Category A".

Category B	An aerodrome which does not satisfy the Category A criteria or requires extra considerations such as: ● high MSA, airport elevation and terrain in the airport vicinity ● the published circling height which is at 1,000' [a)]AGL or higher ● the local ATC that is difficult to communicate with, complex communication procedures or frequent use of non-standard phraseology ● the complexity of airport layout, signs, the availability of ground facilities, ground traffic condition, difficult departure and arrival taxi routes and taxi instructions ● unusual local weather conditions that occur frequently and are hazardous to the flight operations ● complex aircraft navigation associated with SID, EOSID, STAR and APP procedures ● the conditions of runways and terrain that may affect the take-off and landing performance of aircraft ● other relevant considerations.	Prior to operate to a Category B and C aerodrome, the P-i-C shall be qualified according to the requirements. See OM-A 5.2.15.4—Aerodrome Qualification.
Category C	An aerodrome which requires additional considerations to a Category B aerodrome, such as: ● mountainous terrain associated with complex departure, approach and missed approach procedures ● influence of significant weather conditions, windshear or turbulence ● other relevant considerations.	

a) Circling height which is above 1,000' will be considered as a factor affecting aerodrome categorization when there is a possible condition that the circling approach is required, such as an aerodrome with only one runway and only one or no instrument approach type for each runway direction.

Note: Refer to RM/SAI for a list of Category B & C aerodromes.

31. How is the Rescue and Fire Fighting categorized and what are the Rescue and Fire Fighting (RFFS) categories required for your aircraft type?

(OM- A 8.1.2.4)

Rescue and Fire Fighting Service (RFFS) Categorization

Aerodrome RFFS categories have been developed and recommended for use by ICAO (Annex 14) for the purpose of providing information concerning the availability of rescue and firefighting services at aerodromes. It is expressed by figures from 1 to 10 for increasing levels of protection and published in

the appropriate AIP. Normally, all THAI flights shall operate to airports which provide an FFS compatible with the aircraft in accordance with the table below:

THAI Aeroplane RFFS Category Requirements

Aircraft Type	Aeroplane RFFS Category
777(-200ER/-300ER)	9
787-9	9
787-8	8
A350-900	9

Planning

In principle, the published aerodrome RFFS category for a flight should be equal to or better than the aeroplane RFFS category. However, derogation of RFFS categories may be applied when necessary according to the aerodrome RFFS category requirements as recommended in Annex 6, Attachment as follows:

THAI Aerodrome RFFS Category Requirements

Aerodrome	Required Aerodrome RFFS
Departure and Destination	RFFS category for each aerodrome should be equal to or better than the aeroplanes RFFS category. Where a suitable risk assessment has been conducted: ● one category below the aeroplanes RFFS category, or ● two categories below the aeroplanes RFFS category, in the case of a temporary downgrade of 72 hours or less.
Takeoff alternate and Destination alternate	RFFS category for each aerodrome should be equal to or better than the aeroplanes RFFS category. Where a suitable risk assessment has been conducted: ● two categories below the aeroplanes RFFS category, or ● three categories below the aeroplanes RFFS category, in the case of a temporary downgrade of 72 hours or less.
En-route alternate	If at least 30 minutes notice is given to the aerodrome prior to the arrival of the aeroplanes, a minimum of RFFS Category 4, or If less than 30 minutes notice can be given to the aerodrome prior to the arrival of the aeroplanes: ● two categories below the aeroplanes RFFS category, or ● three categories below the aeroplane RFFS category, in the case of a temporary downgrade of 72 hours or less.

Notes: 1.All aerodrome RFFS category shall not be lower than category 4.
2.Temporary downgrade of RFFS category of an aerodrome which results from the downgrade of the level of RFFS protection available shall be notified by NOTAM.
3.If an individual aerodrome serves more than one purpose, the highest required category corresponding to that purpose at the time of expected use applies.
4.When the number of movements of the aeroplanes in the highest category normally using

the aerodrome is less than 700 in the busiest consecutive three months, the category provided may be one lower than the determined category (Annex 14, Volume I).

For all-cargo operations, further reductions might be acceptable provided a risk assessment is performed and the RFFS capability is adequate to arrest fire around the flight deck area long enough for the persons on board to safely evacuate the aeroplanes.

An aerodrome with RFFS category below the protection levels described in the tables above may be acceptable if other considerations prevail, such as weather conditions, runway(s) characteristics, or length of diversion. Such variations shall be based on a specific risk assessment and coordination between THAI and the aerodrome operator or airport authority and approved by DO.

In Flight

The RFFS category requirement during planning is also applicable for in-flight re-planning.
The P-i-C may decide to land at an aerodrome regardless of the RFFS category if, in the pilot's judgment after due consideration on all of prevailing circumstances, to do so would be safer than to divert.

32. Explain takeoff alternate.

(OM- A 8.1.3.2.2)

Planning Minima for Takeoff Alternate

When the weather at the departure airport is such that it is not possible to plan to come back for landing for any reason, an adequate takeoff alternate must be selected.

An adequate airport can only be selected as a takeoff alternate if the appropriate weather reports or forecasts or any combination thereof indicate that:

- during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the airport, the weather conditions will be at or above the applicable landing minima
- the ceiling must be taken into account when the only approaches available are non-precision and/or circling approaches
- any limitation related to one-engine inoperative operation must be taken into account.

Takeoff Alternate Planning Minima

The takeoff alternate aerodrome shall be located within the following flight time distance from the aerodrome of departure:

1. for aeroplanes with two engines, one hour of flight time at a one-engine inoperative cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual takeoff mass,
2. for aeroplanes with three or more engines, two hours of flight time at an all engine operating cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual takeoff mass, or
3. for aeroplanes engaged in extended diversion time operations (EDTO) where an alternate aerodrome meeting the distance criteria of 1) or 2) is not available, the first alternate aerodrome located within the distance of the operator's approved maximum diversion time considering the actual takeoff mass.

33. How many Flight Planning Methods of Thai's fuel policy? (OM-A 8.1.7.2)

THAI's fuel policy has 2 main compliances, Prescriptive and Performance-Based, which are divided into 7 different flight planning methods as described below:

Operation Based on	Flight Planning Method
Prescriptive Compliance (Annex 6, Part I)	1. Basic Fuel Planning (Planning with one Destination Alternate)
	2. Planning with Two Destination Alternates
	3. Planning for Isolated Destination
	4. Planning without Destination Alternate
Performance-Based Compliance (Doc 9976)	5. Planning with CF 3% ERA (En-route Alternate)
	6. Planning with Secondary Destination via PDP (RCF)
	7. Planning with Statistical (SCF)

Flight Operations is responsible for evaluation of the flights utilizing performance-based fuel planning. These flights should be acknowledged by CAAT. During pre-flight, communication between pilots and OP/OW via ACARS or SATCOM shall be available.

34. Described Basic Fuel Planning. (OM-A 8.1.7.3)

Item	Requirements
Taxi fuel:	● Taxi fuel shall include the amount of fuel expected to be used prior to takeoff, taking into account the local condition at the departure aerodrome and APU consumption. The taxi fuel shall be performance-based, if available, or the standard taxi fuel which is type specific. See OM-A 8.1.7.11.1—Standard Taxi-out Fuel Quantity. ● Taxi fuel may be allocated above the standard quantity for some departure aerodromes at specific period of time in accordance with local conditions, such as ground traffic condition, parking bay in relation to departure runway, expected taxi time, de/anti-icing requirement, NOTAM of special movement or performance-based taxi fuel. ● P-i-C may adjust the amount of taxi fuel but it shall not be less than the standard taxi-fuel.
+ Trip fuel	The amount of fuel required to: ● takeoff and climb from aerodrome elevation to initial cruising level/ altitude, taking into account the expected departure routing ● cruise from top of climb to top of descent, including any step climb/descent ● descent to the point where the approach is initiated, taking into account the expected arrival procedure ● approach and landing at the destination aerodrome.
+ Contingency fuel	Contingency fuel during pre-flight shall be: ● 5% of the planned trip fuel, in accordance with OM-A 8.1.7.12, or ● CF 3% ERA of the planned trip fuel, in accordance with OM-A 8.1.7.12, or ● 5% from the point of in-flight re-planning to the intended destination based on the consumption rate used to plan the trip fuel. *Note: In any case, CF shall not be lower than the amount required to fly for 5 minutes at holding speed at 450 m (1,500 ft) above the destination aerodrome in standard conditions.*

+ Destination alternate fuel	When required by weather forecast, the destination alternate fuel shall consist of: ● fuel for a missed approach from the applicable DA/H or MDA/H at the destination aerodrome to missed approach altitude, taking into account the complete missed approach procedure ● fuel for climb from missed approach altitude to cruising level/altitude, taking into account the expected departure routing ● fuel for cruise from top of climb to top of descent, taking into account the expected routing ● fuel for descent from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure ● fuel for executing an approach and landing at the destination alternate aerodrome. *Note: If 2 destination alternate aerodromes are required, the destination alternate fuel shall be sufficient to proceed to the alternate aerodrome that requires the greater amount.*
+ Final reserve fuel	For jet aircraft, the fuel should be sufficient to: ● fly for 30 minutes at holding speed at 1,500 ft above aerodrome elevation in standard conditions. The calculation shall be based on the estimated LDG mass at the destination alternate aerodrome or at the destination aerodrome, if no destination alternate aerodrome is planned.
+ Additional fuel	Supplementary fuel uplifted for the purposes of: ● proceeding to an adequate alternate aerodrome in the event of engine failure or loss of pressurization based on the assumption that such a failure occurs at the most critical point along the route and hold for 15 min at 1,500 ft above aerodrome elevation in standard conditions and make an approach & landing, or ● allow an aeroplane engaged in EDTO to comply with the EDTO critical fuel scenario as established by CAAT, or ● meet additional requirements as the effects of deferred maintenance items and/or configuration deviations, or ● holding for 15 min at 1,500 ft above destination aerodrome elevation is standard conditions when a flight is operated without a destination alternate aerodrome.
= Required fuel (Regulatory requirements)	
+ Company fuel	Fuel uplifted in addition to minimum ramp fuel to cover Company's specific operational requirements such as destination holding. Where traffic holding is required, the holding time recommended shall be listed on the respective Company's information chart or applicable NOTAM .Fuel quantity shall be based on standard holding consumption table. See OMA 8.1.7.13.1—Standard Holding Consumption. *Note: The P-i-C may disregard this requirement, taking into consideration the wind, weather and traffic.*
+ Discretionary (extra) fuel	Fuel to be carried at P-i-C's discretion if significant deviations from present flight planning are expected.
= Block fuel	

35. Described the condition and fuel for planning without Destination Alternate.

(OM-A 8.1.3.2.5)(OM-A 8.1.7.6)

Planning Minima for Destination without Destination Alternate

The flight can be planned without destination alternate, if:

- the destination is fulfilled with all of the following criteria:
  - the duration of the flight does not exceed 6 hours
  - two separate runways are available and usable at the destination
  - the destination weather forecast indicates that, for the period from one hour before until one hour after the ETA at destination, the ceiling will be at least 2,000 ft or circling height +500 ft whichever is greater, and the visibility will be at least 5 km, or
- the destination is isolated and no adequate destination alternate exists.

Fuel Calculation without Destination Alternate	
Item	**Difference from Basic Procedure**
Taxi fuel	Same as basic procedure
+ Trip fuel	Same as basic procedure
+ Contingency fuel	Same as basic procedure
+ Destination alternate fuel	No destination alternate required
+ Final reserve fuel	Same as basic procedure
+ Additional fuel	**Fuel to fly for 15 minutes at 1,500 ft above destination aerodrome elevation in standard conditions**
= Required fuel (Regulatory requirement)	
+ Company fuel	Same as basic procedure
+ Discretionary (extra fuel) fuel	Same as basic procedure
= Block fuel	

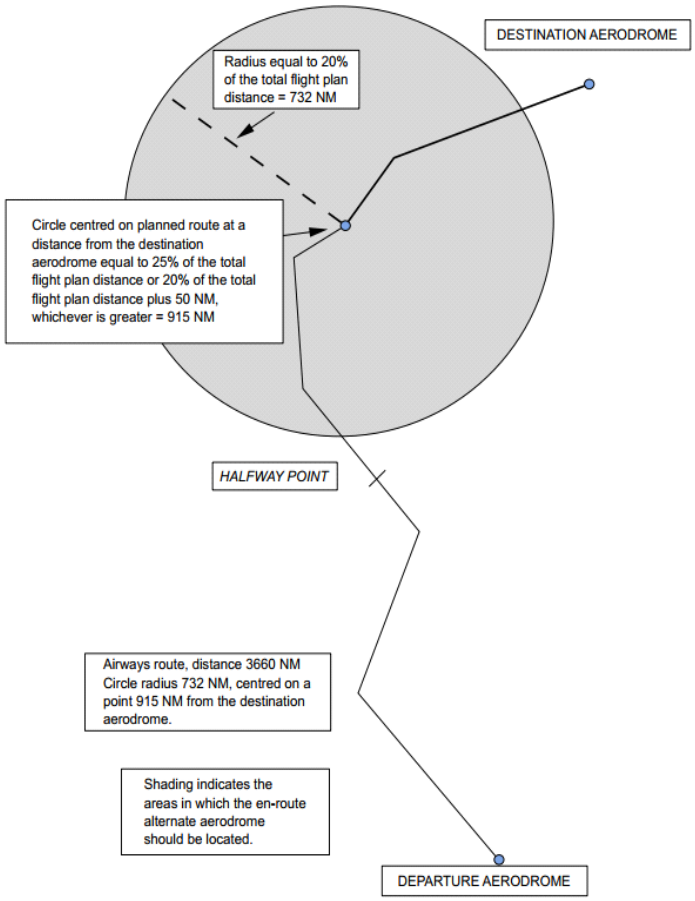
36. Described Planning with CF 3% ERA (En-Route Alternate).

(OM-A 8.1.7.7)

Planning with CF 3% ERA (En Route Alternate)

CF 3% ERA may be planned when En Route Alternate (ERA) is available and its weather forecast meets the requirements in OM-A 8.1.3.2.5—Planning Weather for En Route Alternate and Isolated Airports.

Location of ERA



37. Described Planning with Secondary Destination via PDP (RCF).

(OM- A 8.1.7.9)

Flight planning with secondary destinations may be performed as follows:

- when fuel uplift is restricted by high ZFW and MTOW/MLDW
- when operating near aircraft maximum range
- to follow THAI's policy to minimize the impact on the environment and reduce emissions when statistical data have shown reliable fuel consumption for specific city pair/aircraft type combination.

In this case the usable fuel to be on board shall be the greater of:

- the amount calculated via the PDP to the primary destination
- the amount calculated via the PDP to the secondary destination.

Fuel Calculation to Primary Destination via PDP	
Item	**Difference from Basic Procedure**
Taxi fuel	Same as basic procedure
+ Trip fuel	To primary destination aerodrome via PDP
+ Contingency fuel	**5% of estimated fuel consumption from PDP to primary destination but not less than the minimum stated in** OM-A 8.1.7.12—Type Specific Contingency Fuel Values.
+ Destination alternate fuel	• Same as normal procedure, or

	• No destination alternate fuel required if the flight time from PDP to primary destination is 1 hour or less and criteria without destination alternate are met. See OM-A 8.3.2.5.2—Re-planning Procedures.
+ Final reserve fuel	Same as basic procedure
+ Additional fuel	Same as basic procedure
= Required fuel (Regulatory requirements)	
+ Company fuel	Same as basic procedure
+ Discretionary (extra fuel) fuel	Same as basic procedure
= Block fuel	

Fuel Calculation to Secondary Destination	
Item	**Difference from Basic Procedure**
Taxi fuel	Same as basic procedure
+ Trip fuel	From departure aerodrome to secondary destination via PDP
+ Contingency fuel	Same as basic procedure
+ Destination alternate fuel	Only if an alternate for secondary destination is required. See OM-A 8.1.3.2.4—Planning Minima for Destination Alternates, CF3% ERA, en route alternate and Isolated Destination Airports.
+ Final reserve fuel	Same as basic procedure
+ Additional fuel	Same as basic procedure
= Required fuel (Regulatory requirements)	
+ Company fuel	Same as basic procedure
+ Discretionary (extra fuel) fuel	Same as basic procedure
= Block fuel	

38. What are the Destination Weather requirements?

(OM-A 8.1.3.2.3)

Planning Minima for Destination

A destination airport can only be selected if the weather forecast for that particular airport indicates that, for a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the airport, the weather conditions will be at or above the minima as follow:

- RVR/Visibility: at least the prescribed RVR/Visibility for the planned approach procedure, aircraft status, available ground equipment, crew as qualified (see OM-A 8.1.3.3—Aerodrome Operating minima), and
- for a Non Precision Approach or circling operation, the ceiling is above MDH.

Planning minima for isolated destination shall use the same criteria of destination alternate minima.

39. What is a Destination Alternate and what are the Alternate Weather requirements?

(OM- A 8.1.2.5) (OM- A 8.1.3.2.4)

Selection of Airport

Destination alternate : An airport to which a flight may proceed if the destination becomes unavailable. Such airport shall be specified on the Operational Flight Plan and the ATS flight plan.

Planning Minima for Destination Alternates, CF3% ERA, en route alternate and Isolated Destination Airports

At least one destination alternate airport shall be selected and specified in the Operational Flight Plan and ATS flight plan, except in case of planning to isolated destination. The "one step down method" is applied to the planning minima of these airports. Two destination alternate airports must be selected and specified in the Operational Flight Plan and ATS flight plan when:

- the weather conditions at destination are below flight planning minima for destination for a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the airport, or
- no valid forecast is available for destination.

Destination alternate, CF 3% ERA, en route alternate and isolated destination airports can only be selected if the weather report and/or forecast indicates that, for a period commencing 1 hour before and ending 1 hour after ETA , the weather conditions will be at or above the planning minima below.

Destination Alternates

Type of Approach	Planning minima	Remarks
CAT II and CAT III	CAT I [a)]	
CAT I	NPA [a)b)]	
NPA	NPA [a)b)] plus 200 ft/1,000 m	Localizer only and APV approaches are considered NPA.
Circling	Circling	

a) RVR

b) The Ceiling must be at or above the MDH.

Prevailing winds must be taken into consideration when determining which minima shall apply.

40. What is the Isolated Destination airport and fuel planning?

(OM- A 8.1.2.5) (OM-A 8.1.7.5)

Isolated destination

Definition:

A destination aerodrome may be considered isolated, with approval by CAAT, when the fuel required to go-around from Decision Altitude/Height (DA/H) or the Missed Approach Point at the destination airport and then divert to the nearest suitable alternate exceeds, for a turbine-engined aeroplane, the fuel required to hold at the destination airport for 90 minutes.

Remark:

- A turbine-engined aeroplane shall have sufficient fuel to fly for 2 hours (final reserve fuel included) at normal cruise consumption above the destination aerodrome.
- For each flight into an isolated aerodrome, a Point of No Return (PNR) which is the point of last possible diversion to an en route alternate shall be determined.

***Note**: This en route alternate is a general term and is not required to comply with the criteria of ERA.*

- A flight to an isolated aerodrome shall not continue past PNR unless a current assessment of meteorological conditions, traffic and operational conditions which indicates that a safe landing can be made at the estimated time of use is performed. See OM-A 8.3.2.5.2—Re-planning Procedures and OM-A 8.3.7—In-flight Fuel Management.

***Note**: Require Flight Monitoring.*

Note: For THAI's Destination Airport, Perth (PER/YPPH) is considered as an Isolated Destination Airport.
* To use an isolated aerodrome as a destination airport requires CAAT prior approval

Fuel Calculation to Isolated Destination Aerodrome via PNR	
Item	Difference from Basic Procedure
Taxi fuel	Same as basic procedure
+ Trip fuel	To isolated aerodrome via PNR
+ Contingency fuel	Same as basic procedure
+ Destination alternate fuel	No destination alternate required
+ Final reserve fuel	30 minutes of holding fuel above isolated aerodrome which is already included in the 2 hours of Additional Fuel
+ Additional fuel	Fuel to fly for 2 hours at normal cruise speed above the isolated aerodrome
= Required fuel (Regulatory requirement)	
+ Company fuel	Same as basic procedure
+ Discretionary (extra) fuel	Same as basic procedure
= Block fuel	

When planning to an isolated aerodrome, decision to proceed beyond PNR shall be made in accordance with OM-A 3.2.5.2 – Re planning Procedures.

41. What is the Takeoff minima for THAI aircraft?

(OM-A 8.1.3.2.1) (OM-A 8.4.5)

Planning Minima for Takeoff

Takeoff minima are designed to ensure adequate aircraft control guidance to control in the event of both a rejected takeoff and a continued takeoff after an engine failure.

For all multi-engine aircraft, with performance such that in the event of a power loss at any point during takeoff, the aircraft can either stop or continue to a height of 1,500 feet above the aerodrome
while clearing all obstacles by the required margins, the takeoff minima must be expressed as RVR / visibility values and may not be less than those given in the table given below

In case:

- reported meteorological visibility is below that required for takeoff, and
- no reported meteorological visibility and/or RVR is available.

The P-i-C may only start a takeoff if he can determine that the RVR/visibility along the runway is equal to or better than the required minima.

Runway Visual Range

Facilities	RVR/VIS Takeoff Minima in m/ft [a)]
No lights (Day only) [b)]	500 m/1,600 ft
Day: at least runway edge lights or runway center line markings	400 m/1,300 ft
Day: runway edge lights and runway center line markings **Night:** runway edge lights and runway end lights or runway center line lights and runway end lights	300 m/1,000 ft
Runway edge and center line lighting	200 m/700 ft
Runway edge and centerline lighting and Multiple RVR - information	150 m/500 ft [c)]

a) The reported RVR/VIS value referring to the initial part of the takeoff run can be replaced by pilot assessment.
b) The pilot is able to continuously identify the takeoff surface and maintain directional control.
c) The required RVR value must be achieved for all of the relevant RVR reporting points (Touchdown zone (TDZ), the Midpoint (MID) and the Stop-End rollout), to cover accelerate and stop distance with the exception given below:

Low Visibility Takeoff (LVTO)
Any takeoff with a visibility <400 m RVR is considered a LVTO

LVTO Minima

Aircraft type	RVR (m)
777-200ER/-300ER	150 m
A350-900	150 m
787-8	150 m
787-9	150 m

42. What are the weather requirements for Category II/III ?

(OM- A 8.1.3.3.5)

Operating Minima for All Weather Operations (AWO)

Precision Approach CAT II

- Category II

A category II operation is a precision instrument approach and landing using ILS or MLS with:
– a RVR of not less than 300 m
– a decision height below 200 ft and not lower than 100 ft.
The DH shall be not lower than:
– the minimum DH specified in the FCOM
– the minimum height to which the precision approach aid can be used without the required visual reference
– the OCH/OCL for the category of the aircraft
– the DH to which the flight crew is authorized to operate
– 100 ft.
Note: Crosswind component must not exceed 10 kt.

Precision Approach CAT III

- Category III

  A category III operation is a precision instrument approach and landing using an ILS to descend below CAT I minima:
  - Category III A approach is a precision instrument approach and landing with:
    - a decision height lower than 100 ft (30 m or no decision height), and
    - a runway visual range not less than 175 m.
  - Category III B approach is a precision instrument approach and landing with:
    - a decision height lower than 50 ft (15 m) or no decision height, and
    - a runway visual range less than 700 ft (200 m) but not less than 75 m.

Note: Where the decision height (DH) and runway visual range (RVR) do not fall within the same Category, the RVR will determine in which Category the operation is to be considered.

For operations in which a DH is used, the DH must not be lower than:
- the minimum decision height specified in the AFM
- the minimum height to which the precision approach aid can be used without the required visual reference
- the decision height to which the flight crew is authorized to operate.

Operations with no DH may only be conducted if:
- operation with no decision height is authorized in the AFM
- approach aid and airport facilities can support operations with no DH
- the operator has an approval for CAT III operation with no DH.

Note: In case of a CAT III runway, it may be assumed that operations with no decision height can be supported unless specifically restricted as published in the AIP or NOTAM.

- AWO operating minima chart

Approach category	Decision Height (ft)	Roll-out control/ guidance system	RVR (m)
III A	Less than 100 ft	Not required	200 m
III B	Less than 100 ft	Fail-passive	150 m
III B	Less than 50 ft	Fail-passive	125 m
III B	Less than 50 ft or no DH	Fail-operational	75 m

- Specific company authorizations

Aircraft type	Category III A operations	Category III B operations
777-200ER/-300ER 787-8 787-9 A350-900	DH 50 ft/RVR 200 m No DH/RVR 175 m	DH 20 ft/RVR 100 m No DH/RVR 75 m

Landing Minima (8.4.6.1)

CAT II Minima

Aircraft type	RVR (m) / DH (ft)
777-200ER/-300ER	300/100
A350-900	300/100
787-8	300/100
787-9	300/100

CAT III A Minima

Aircraft type	RVR (m) / DH (ft)	RVR (m) / No DH
777-200ER/-300ER	200/50	175/No DH
A350-900	200/50	175/No DH
787-8	200/50	175/No DH
787-9	200/50	175/No DH

CAT III B Minima

Aircraft type	RVR (m) / DH (ft)	RVR (m) / No DH
777-200ER/-300ER	100/20	75/No DH
A350-900	100/20	75/No DH
787-8	100/20	75/No DH
787-9	100/20	75/No DH

43. What is visual reference for Non-Precision Approach ?

(OM-A 8.1.3.3.1)

Visual Reference for Category I, APV, and NPA

A pilot may not continue an approach below MDA/MDH unless at least one of the following visual references for the intended RWY is distinctly visible and identifiable to the pilot:

- elements of the approach light system
- the threshold
- the threshold markings
- the threshold lights
- the threshold identification lights
- the visual glide slope indicator
- the touchdown zone or touchdown zone markings
- the touchdown zone lights
- runway edge lights, or
- other visual references accepted by the Authority

44. What is the minimum visibility requirement to conduct a CAT I approach?

(OM- A 8.1.3.3.4)

Determination of RVR/CMV/VIS Minima for CAT I, APV and NPA

DH or MDH	Class of Lighting facility			
	RVR/CMV (m)			
Feet	FALS	IALS	BALS	NALS
200 – 210	550m (RVR only)	750m (RVR only)	1000m	1200m
211 – 220	550m (RVR only)	800m	1000m	1200m
221 – 230	550m (RVR only)	800m	1000m	1200m
231 – 240	550m (RVR only)	800m	1000m	1200m
241 – 250	550m (RVR only)	800m	1000m	1300m
251 – 260	600m (RVR only)	800m	1100m	1300m
261 – 280	600m (RVR only)	900m	1100m	1300m
281 – 300	650m (RVR only)	900m	1200m	1400m
301 – 320	700m (RVR only)	1000m	1200m	1400m
321 – 340	800m	1100m	1300m	1500m
341 – 360	900m	1200m	1400m	1600m
361 – 380	1000m	1300m	1500m	1700m
381 – 400	1100m	1400m	1600m	1800m
401 – 420	1200m	1500m	1700m	1900m
421 – 440	1300m	1600m	1800m	2000m
441 – 460	1400m	1700m	1900m	2100m
461 – 480	1500m	1800m	2000m	2200m
481 – 500	1500m	1800m	2100m	2300m
501 – 520	1600m	1900m	2100m	2400m
521 – 540	1700m	2000m	2200m	2400m
541 – 560	1800m	2100m	2300m	2500m
561 – 580	1900m	2200m	2400m	2600m
581 – 600	2000m	2300m	2500m	2700m
601 – 620	2100m	2400m	2600m	2800m
621 – 640	2200m	2500m	2700m	2900m
641 – 660	2300m	2600m	2800m	3000m
661 – 680	2400m	2700m	2900m	3100m
681 – 700	2500m	2800m	3000m	3200m
701 – 720	2600m	2900m	3100m	3300m
721 – 740	2700m	3000m	3200m	3400m
741 – 760	2700m	3000m	3300m	3500m
761 – 800	2900m	3200m	3400m	3600m
801 – 850	3100m	3400m	3600m	3800m
851 – 900	3300m	3600m	3800m	4000m
901 – 950	3600m	3900m	4100m	4300m
951 – 1000	3800m	4100m	4300m	4500m
1001–1100	4100m	4400m	4600m	4900m

Note: *An instrument approach may not be conducted if the visibility is below 800 meters or the Converted Meteorological Visibility is below 800 meters RVR, unless RVR reporting is available for the runway of intended use.*

45. What is visual reference for CAT IIIA approach?

(OM-A 8.1.3.3.5)

- Visual references for CAT III A operations, a pilot may not continue an approach below DH unless a visual reference containing at least 3 consecutive lights being:
  – the centerline of the approach lights, or
  – the touchdown zone lights, or
  – the runway centerline lights, or
  – the runway edge lights, or
  – a combination of these is attained and can be maintained.

For CAT III B operations with fail-operational flight control systems using a DH, a pilot may not continue an approach below the DH unless a visual reference containing at least one centerline light is attained and can be maintained.

For CAT III operations with no DH there is no requirement for visual contact with the runway prior to touchdown.

The allowing RVR is dependent on the level of aeroplane equipment. A CAT III runway may be assumed to support operations with no decision height unless specifically restricted as published in the AIP or NOTAM

46. State the requirements for night landing ?

(OM-A 8.1.3.3.7)

Requirement for Night Landing

When performing night landings the following aids must be installed and functioning:

- glide path reference, which may consist of:
  – an ILS glide path or
  – approach lights with at least one crossbar or a center line consisting of barrettes or
  – a Visual Approach Slope Indicator system.
- runway edge lights, threshold lights and runway end lights.

Note: Barrettes are three or more aeronautical ground lights arranged in such a way that from a distance they appear as a short cross bar of lights.

47. What is the Alert Height ? (OM- A 8.4.3)

Alert Height

The alert height is a specified radio height, based on the characteristics of the aircraft and its fail operational landing system. In operational use if:

- failure occurs above Alert Height in one of the aircraft's required redundant operational systems, the approach would be discontinued and a go-around executed unless reversion to a higher decision height is possible
- a failure in one of the required redundant operational systems occurs below the Alert Height, it would be ignored and the approach continued.

The AH is only linked to the probability of failure(s) of the automatic landing system. THAI select the AH indicated in the FCOM of each aircraft type.

48. Standard Meteorological information shall contain:

(OM- A 8.1.6)

Interpretation of Meteorological Information

Standard Meteorological information shall contain at least:

- a Significant Weather Chart corresponding to the flight
- upper Temperatures/Winds charts in accordance with the different FL intended to be used during the flight
- aerodrome reports (METAR)
- aerodrome forecasts (TAF) for departure, destination, destination alternate and en route alternate airports
- SIGMET information corresponding to the flight
- SNOWTAM when applicable.

Documentation shall cover the flight in respect of time, altitude and geographical extent, including the route(s) between the destination and the destination alternate(s). It shall also cover a potential unscheduled intermediate landing.

Refer to RM/FPL for interpretation of the various meteorological information as well as decoding charts

49. Can P-i-C order final ramp fuel lower than minimum fuel in flight plan?

(OM-A 8.1.7.2)

Flight Planning and Fuel Management (FPFM) Policy

THAI employs a conservative approach in its fuel planning so as to ensure that the minimum dispatch fuel for a flight shall exceed the legal minimum requirements. To strictly adhere to this policy, THAI shall obtain the information necessary to monitor fuel uplifts, ensure that the fuel planning requirements employed in dispatching flights are consistent with the current policy and keep fuel records which are required by CAAT for a minimum period of 3 months. Apart from Safety, the main objective in FPFM is to support THAI business performance as well as minimize the impact on the environment. THAI shall work with CAAT to improve overall operational efficiency and reduce emissions by introducing a performance-based approach. Such an approach can foster statistically driven and risk-managed alternatives to prescriptive alternate aerodrome selection and fuel planning regulations.

During pre-flight, advances in OFP and aircraft FMS should be used independently but for the same purpose of flight safety in term of fuel planning. The fuel requirements from both OFP and FMS should agree and be sufficient for flight. Statistically driven alternative also requires the correctness of database. Therefore, when ZFW has been changed from the original flight plan more than:

- 5 tons in case of flight time is 6 hours or less, or
- 3 tons in case of flight time is more than 6 hours, or
- Any change in EZFW as requested by the flight crew

The flight operation officer shall provide the information on re-calculation OFP to the flight crew.

Note: The accuracy of fuel planning is important because fuel cost accounts for approximately 30 % of the total expense of the company.
P-i-C may order discretionary (extra) fuel in addition to the minimum fuel at his/her discretion if significant deviations from present flight planning are expected. **He/she should also adjust the minimum fuel in case there are changes in ZFW, Contingency Fuel (CF), selected destination alternate or flight altitude planning.**

50. How can P-i-C ensure the minimum fuel requirements before commencement flight?

(OM- A 8.1.7.2, 8.1.7.14)

In order to prevent an excessive consumption of CF/SCF and ensure that a part of CF/SCF remains unused on ground, P-i-C shall record the fuel remaining on board and ensure that it meets the requirements of the minimum fuel at the Commencement of Flight. See OM-A 8.1.7.14 – Before Commencement of Flight

Before Commencement of Flight

It is important to note that the taxi fuel dose not account for delays that are unknown at the planning stage. The burning of fuel over the planned taxi fuel before take-off can affect the remaining quantity in the usable fuel equation, Therefore, the decision to burn into other fuels, including CF, should be carefully considered to ensure that the remaining fuel is sufficient for the flight taking into account any conceivable occurrences that would require analysis and, if necessary, adjustment of the OFP by co-ordination with Flight Monitoring team. A flight shall not commence unless the usable fuel on board meets the requirements.

51. What is an En-Route Alternate aerodrome?

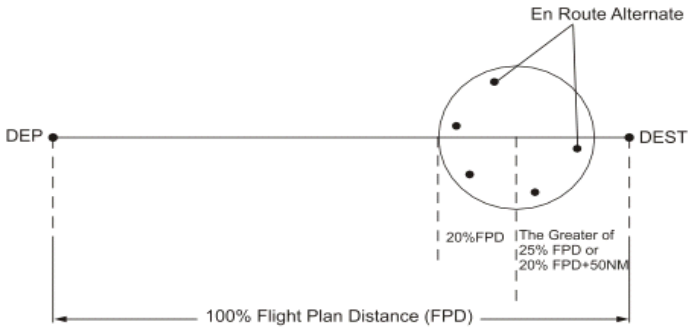
(OM- A 8.1.2.5)

En-Route Alternate (ERA):
Airport which should be located within a circle with a radius equal to 20% of the total flight plan distance, the center of which lies on the planned route at a distance from destination of 25% of the total flight plan distance, or 20% of the total flight plan distance plus 50 Nm, whichever is greater.

Remarks:

- Whenever possible, aerodrome close to the intended track should be selected. The weather at ERA shall be forecasted and expected to be at or above destination alternate minima.
- Used in conjunction with CF 3% ERA and SCF.

Figure 3—En Route Alternate (ERA)



52. What is the Contingency Fuel ?

(OM-A 8.1.7.1) (OM-A 8.1.7.2)

Contingency Fuel (CF): An amount of fuel required to compensate for unforeseen factors, which is 5% of the planned trip fuel or of the fuel required from the point of in-flight re-planning based on the consumption rate used to plan the trip fuel or 3% of the planned trip fuel if an ERA is available (CF 3% ERA). However, CF shall not be lower than the amount required to fly for 5 minutes at holding speed at 450 m (1,500 ft) above the destination aerodrome in standard conditions.

Note: For the purposes of applying the provisions, the terms “point of in-flight re-planning”, “re-release point”, “re-dispatch point” and “decision point” are synonymous.

Contingency Fuel (CF) is defined as the fuel required to compensate for factors that cannot be foreseen during flight planning such as:

- deviations of an individual aeroplane from the expected fuel consumption data
- unforeseen meteorological conditions
- extended delays (on the ground or in the air), or
- deviations from planned routings and/or cruising levels/altitudes.

53. Describe the Taxi Fuel.

(OM-A 8.1.7.3, OM-A 8.1.7.11)

Taxi fuel:
- Taxi fuel shall include the amount of fuel expected to be used prior to takeoff, taking into account the local condition at the departure aerodrome and APU consumption. The taxi fuel shall be performance-based, if available, or the standard taxi fuel which is type specific. See OM-A 8.1.7.11.1—Standard Taxi-out Fuel Quantity.
- Taxi fuel may be allocated above the standard quantity for some departure aerodromes at specific period of time in accordance with local conditions, such as ground traffic condition, parking bay in relation to departure runway, expected taxi time, de/anti-icing requirement, NOTAM of special movement or performance-based taxi fuel.
- P-i-C may adjust the amount of taxi fuel but it shall not be less than the standard taxi-fuel.

Standard Taxi-out Fuel Quantity

The standard taxi-out fuel is used for flight plan fuel calculation for every flight. The standard taxi-out fuel includes the amount of fuel used for 20 minutes of APU operation, engines starting and 12 minutes of taxi-out time, and is as follows:

Aircraft Type	Standard Taxi-Out Fuel Quantity (kg)
777-300ER	600
777-200ER	400
A350-900	400
787-8	300
787-9	300

However, the P-i-C may adjust this requirement if he deems necessary, taking into consideration, his experience and the actual flight conditions.

Standard Taxi-in Fuel Quantity

The Standard taxi-in fuel is used for flight plan fuel calculation only for THRU tankage flight. The standard taxi-in fuel includes the amount of fuel used for 45 minutes of APU operation and 5 minutes of taxi-in time, and is as follows:

Aircraft Type	Standard Taxi-in Fuel Quantity (kg)
777-300ER	300
777-200ER	300
A350-900	300
787-8	300
787-9	300

However, the P-i-C may adjust the quantity of either standard taxi-out and/or taxi-in fuel if he deems necessary taking into account his experience and the actual flight conditions such as parking position and runway for departure and/or arrival.

54. What is a Company Fuel, Alternate Fuel and Final Reserve Fuel? When a Go-around is made, which portion of the fuel is being used?

(OM-A 8.1.7.3, OM-A 8.1.7.13)

Item	Requirements
Company fuel	Fuel uplifted in addition to minimum ramp fuel to cover Company's specific operational requirements such as destination holding. Where traffic holding is required, the holding time recommended shall be listed on the respective Company's information chart or applicable NOTAM .Fuel quantity shall be based on standard holding consumption table. See OMA 8.1.7.13.1—Standard Holding Consumption. **Note**: The P-i-C may disregard this requirement, taking into consideration the wind, weather and traffic.
Destination alternate fuel	When required by weather forecast, the destination alternate fuel shall consist of: ● **fuel for a missed approach from the applicable DA/H or MDA/H at the destination aerodrome to missed approach altitude, taking into account the complete missed approach procedure** ● fuel for climb from missed approach altitude to cruising level/ altitude, taking into account the expected departure routing ● fuel for cruise from top of climb to top of descent, taking into account the expected routing ● fuel for descent from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure ● fuel for executing an approach and landing at the destination alternate aerodrome. **Note**: If 2 destination alternate aerodromes are required, the destination alternate fuel shall be sufficient to proceed to the alternate aerodrome that requires the greater amount.
Final reserve fuel	For jet aircraft, the fuel should be sufficient to: ● fly for 30 minutes at holding speed at 1,500 ft above aerodrome elevation in standard conditions. The calculation shall be based on the estimated LDG mass at the destination alternate aerodrome or at the destination aerodrome, if no destination alternate aerodrome is planned.

55. When do we need Additional Fuel?

(OM-A 8.1.7.3)

Item	Requirements
Additional fuel	Supplementary fuel uplifted for the purposes of: ● proceeding to an adequate alternate aerodrome in the event of engine failure or loss of pressurization based on the assumption that such a failure occurs at the most critical point along the route and hold for 15 min at 1,500 ft above aerodrome elevation in standard conditions and make an approach & landing, or ● allow an aeroplane engaged in EDTO to comply with the EDTO critical fuel scenario as established by CAAT , or ● meet additional requirements as the effects of deferred maintenance items and/or configuration deviations, or ● holding for 15 min at 1,500 ft above destination aerodrome elevation is standard conditions when a flight is operated without a destination alternate aerodrome.

56. When is Extra Fuel requiring ? (OM-A 8.1.7.3)

Discretionary (extra) fuel: Fuel to be carried at P-i-C's discretion if significant deviations from present flight planning are expected.

57. How do we calculate the amount of fuel for THRU Tankage?

(OM-A 8.1.7.13.2)

THRU Tankage:

THRU tankage is the sum of minimum fuel required for the last sector and burn off fuel for the previous sector(s).

Note: Burn off fuel is the sum of trip fuel, taxi-out fuel and taxi-in fuel.

58. Why a flight is sometimes planned with economy tankage and what is taken care of when planning a flight with economy tankage?

(OM-A 8.1.7.13.2)

Economy Tankage

On flights where fueling in excess of the minimum requirements will result in a saving in operating costs, an economy tankage shall be established. This tankage must be limited to an amount which will ensure safe operation even at the increased weight.

To avoid a weight problem on sectors which are limited by maximum landing weight (MLW), a suitable margin shall be left when calculating the total amount of fuel to allow for a last minute increase of payload or less fuel consumption than the figures calculated in the CFP as a result of changes in actual flight conditions such as shortcuts and wind.

The recommended pre-planned landing weight for the aircraft types are as follows:

Aircraft Type	Landing Weight
777-200ER/-300ER	MLW minus 2.0 tons
787-8	MLW minus 2.0 tons
787-9	MLW minus 2.0 tons
A350-900	MLW minus 2.0 tons

59. Who shall sign and responsible for loadsheet, NOTOC?

(OM-A 8.1.8.2.2)

By signing the loadsheet, and NOTOC as applicable, the P-i-C certifies on behalf of the Company that the requirements are complied with:

Even if some tasks have been delegated to various Company officials, the P-i-C is still responsible to ensure, to the best of his knowledge, that the correct procedures are followed for preparing the flight for a safe operation.

60. What are items to be checked on Loadsheet/NOTOC?

(OM-A 8.1.8.3.1)

Items to be checked on Loadsheet/NOTOC

Items to be checked on Loadsheet	• Flight number. • Aircraft registration/version. • Crew. • Takeoff and trip fuel.	Refer to LCM Part 1, 17.3 & 17.4.
In addition, on Manual Loadsheet, also check	• DOW/DOI • Actual takeoff, landing and zero fuel weight to be equal to or below MAX • Center of gravity location within limits	
Items to be Checked on NOTOC	• Flight number • Dangerous Good load position • UN Drill code	If the drill code is not shown on the NOTOC: • refer to ICAO's Emergency Response. Guidance using the UN number or proper shipping name • note the code on NOTOC. - Review applicable Emergency Procedures • Refer to LCM Part 1, 17.2— Load Information Documents.

61. What are the acceptable tolerances of DLI and LIZFW between the EDP load sheet and balance table for your aircraft type ?

(OM-A 8.1.8.3.1)

Slight differences might be discovered when checking the EDP balance figures using the applicable Balance Table carried in the LCF and/ or LCM. This is due to the fact that the EDP software considers every single kilogram of load in each compartment, whereas manual Balance Tables are based upon group figures and rounded index values.

The following tolerances shall therefore be accepted:

Tolerances

Aircraft type	DLI	LIZFW
777-200ER/-300ER	±3.0	±5.5
787-8	±3.0	±5.5
787-9	±3.0	±5.5
A350-900	±3.0	±5.5

In case any value exceeds these limits, the Load Control Supervisor shall be asked to verify the loadsheet.

62. According to Mass & Balance Documentation Control, Before starting aircraft movement, the P-i-C shall ensure that: (OM-A 8.1.8.3.2)

Before starting aircraft movement, the P-i-C shall ensure that:

- the ZFW and actual gross weights for takeoff and landing do not exceed maximum allowed weights
- the actual fuel corresponds to loadsheet fuel. If deemed necessary, a last-minute correction shall be made
- any LMC received after having checked the loadsheet are included
- the weight and balance of the aircraft is such that the flight can be conducted safely, taking into account the flight conditions
- the actual fuel is sufficient in regard of the last-minute changes in takeoff weight
- the co-pilot has received the NOTOC
- the "Cabin clear" report has been received from the cabin crew.

Any discrepancies noted between stated and actual conditions may be amended by the P-i-C in order to avoid delays, provided ground personnel are informed of the corrections before takeoff.

63. When loading error is suspected what should the P-i-C do ?

(OM-A 8.1.8.3.3)

After takeoff - Suspected Load Error

In case of suspected loading error or when the longitudinal stability of the aircraft during flight demonstrates significant impairment, the P-i-C shall, after landing, order a load weight check. In any case, an ASR shall be filled out following such an event. In addition an Aircraft Log remark entry shall be made since it would most probably relate to flight control problem. The remark should essentially state that a load weight check has been performed and that an ASR/ASRTEX has been submitted.

Whenever a loading error is suspected, or when the longitudinal stability of the aircraft is impaired, the following items shall be completed:

- In flight:
  - contact station concerned and inform that a load weight check has to be performed upon landing
  - note actual passenger seating per seat row.
- On ground:
  Ensure, in cooperation with ground staff, that a proper load weight check is performed by:
  - checking that the compartment load is properly separated and net positions noted
  - the actual position and weight of the load in each compartment are mentioned
  - comparing the actual load in each compartment with the load in accordance with the loadsheet and note any difference
  - attaching a copy of the loadsheet together with the figures noted as above to the ASR/ASRTEX.

64. In the event of last minute change which item need to be re-verified ?

(OM-A 8.1.8.4.1)

Last Minute Changes (LMC)

Traffic Load

Last Minute Change (LMC) address any change concerning DOW, (crew and catering) or Traffic Load (passengers, baggage, and cargo) occurring after the issuance of the Load and Trim sheet. In the case of Last Minute Change, four checks must be performed as follows:

Last Minute Change

Total weight of the LMC < Underload	● underload is the difference between the maximum allowed payload for that flight and the actual payload ● ensures that MTOW is not exceeded by taking into account maximum structural limitations
Total weight of the LMC < maximum allowable LMC	● maximum allowable LMC for 737 is 250 kg and 1,000 kg for all aircraft types ● a new loadsheet is required when LMC exceeds the maximum allowable value
Center of gravity must stay within the operational limits.	● LMC influence on aircraft balance must always be assessed
For LMC consisting of cargo (baggage or freight)	● compartment and positions maximum load must not be exceeded ● in case of exceedance, a new load and trim sheet must be issued.

Any LMC must be brought to the attention of the P-i-C and mentioned on the load and trim sheet.

Fuel LMC

Fuel LMC can reflect a change on the Takeoff fuel or on Trip fuel. In case of fuel LMC, the takeoff and landing weights must be updated taking into account the added or removed fuel quantity. The crew must ensure that the impact on the aircraft balance is either negligible or considered.

Traffic Load and Fuel LMC

When both traffic load LMC and fuel LMC are considered, all aircraft maximum weights must be reevaluated as follows:

- ZFW (Zero Fuel Weight) must be recalculated to reflect the traffic load LMC
- TOW (Takeoff Weight) and LDW (Landing Weight) must be recalculated to reflect the fuel LMC.

65. In which situation shall the filed flight plan be amended ?

(OM-A 8.1.9)

Flights shall primarily be planned in controlled airspace which is adequately covered by air traffic services. In special cases, DO within his authority, may give permission to perform flights over the areas where no air traffic service is provided.

Prior to departure, unless a Repetitive Flight Plan (RPL) is filed, an ATS Flight Plan shall be submitted to the ATS reporting office at the departure aerodrome, generally 60 min before the estimated off-block time. The instructions for completion of the ICAO flight plan form, and also example of completed flight plan form, are given in RM/RAR.

A flight plan should be amended whenever the flight is delayed from a given ETD in excess of 30 min or if there is any change in the preceding FPL. In this circumstance, flight dispatcher shall, before informing the P-i-C, coordinate with the appropriate ATS units regarding the reception and acknowledgement of the change.

66. What is the aircraft type designator use for ATS flight plan filing for your aircraft type ?

(OM-A 8.1.9.4)

Aircraft Type Designators

The following Aircraft Type Designators shall be used for ATS flight plan filing, In accordance with ICAO Doc 8643:

777-300ER	B77W
777-200/777-200ER	B772
787-8	B788
787-9	B789
A330-300	A333
A350-900	A359

67. What shall be read back when communicate with ATC?

(OM-A 8.10.4.1)

Communication and Reporting

General

The following clearances/instructions shall always be read back:

- ATC route clearances unless otherwise authorized by the appropriate authority
- taxi, takeoff and landing clearances

- the runway-in-use
- instructions to enter cross and back track on the runway-in-use (note)
- instructions to hold short of the runway-in-use
- transponder codes and other SSR operating instructions
- heading and speed instructions
- altimeter settings
- altitude and flight level instructions
- frequency change.

***Note**: Thai advises that permission to cross or enter a runway should be requested, whether it is a runway-in-use or not.*

68. What is the Operation Briefing Card ?

(OM-A 8.1.13.3.2)

Operation Briefing Cards (OBC)

Operations Briefing Cards (OBC) are provided for crew members. They are located inside the front cover of the Technical Log, and for cabin crew—located inside front cover of the Cabin Log.

The purposes of the OBC is:

- to provide operational information that, due to time or other constrains, cannot be provided through normal channel or through manual/document revisions
- to provide operational information that are temporary in nature
- to enable instructions or requirements about aircraft system or operations to be provided at short notice.

Pilot and Cabin Crew OBC are provided for each aircraft, the copy of each is also provided on the OH.

69. Explain procedure fueling with passenger on board ?

(OM-A 8.2.1.2)

Fueling/De-fueling when Passengers are Embarking/Disembarking/on Board

Under certain conditions, the fueling with Kerosene (JET A, JET A1) is permitted while passengers are embarking, remaining on board, or disembarking.

Note: Fueling of wide-cut fuel (e.g. JET B/JP4 or equivalent) with passengers embarking, on board or disembarking is not allowed.

If the presence of fuel vapour is detected inside the cabin, or any hazard arises during the re-/de-fueling, the process must be stopped immediately.
In case of fire, the crew shall ensure a coordinated and expeditious evacuation/rapid disembarkation at any time.

The following duties apply:

Personnel	Duties
Flight crew	● Comply with the CRAR and aerodrome regulations. ● Check local requirements with respect to the attendance of the RFFS. ● Cabin crew, passengers, ramp/ground staff and ground engineer must be informed that re-/de-fueling will take place. ● On flight arrival, do not start fueling before passenger jet way/stairs are positioned and the passengers have started disembarking.

	● A two-way communication must be established and must remain available between the flight and cabin crew and between flight crew and ground engineer. ● Designate at least one exit door as the primary exit intended for an emergency evacuation/rapid disembarkation with at least one jet way/stairs in position and make sure that nothing obstructs the area outside that exit. ● If only one primary exit is available, designate at least one secondary exit to be used in case the primary exit becomes unavailable. A jet way/stairs must be in position and make sure that nothing obstructs the area outside that exit. Secondary exit door must be closed and disarmed with the assigned cabin crew standby until the re-/de-fueling is completed. ● An exit with an inflatable escape slide may be designated as a primary and/or secondary exit when a jet way or stairs are not available. The ground area beneath that exit (and the associated slide deployment area) must be kept clear and free of vehicles/obstacles on the ramp within at least 12 m from the aircraft. ● Brief all cabin crew regarding the exits to be used as primary and/or secondary exits in case of evacuation/rapid disembarkation. ● Switch OFF "Fasten Seat Belt" signs. ● Switch ON "No-smoking" signs, if available on the aircraft. ● Switch ON the interior lighting indicating emergency exits. ● At least one flight crew must remain in the cockpit during the entire process inform the cabin crew when the fueling starts and ends. ● Watch out for any sign of abnormal event, smell or fire and smoke warning. ● Be prepared to initiate a passenger evacuation/ rapid disembarkation if necessary
Cabin crew	● Establish a two-way communication between the flight and cabin crew for emergencies and commencement and completion of re/de-fueling information. ● Acknowledge the positions of primary and/or secondary exits designated by the flight crew. ● The minimum number of require cabin crew must be present on board and in the vicinity of their assigned station. ● Each of the designated exit must be constantly manned by the least one cabin crew. ● Be prepared for an immediate emergency evacuation/rapid disembarkation. ● Ground servicing activities and work within the aircraft, such as catering and cleaning, should be conducted in such a manner that they do not create a hazard or obstruct exits. ● The aisles and emergency exits in the aircraft cabin should be kept clear of obstructions. ● Block all lavatories during the entire process. ● Secure all dividers/curtains in the open position. ● Pay special attention to PRM passengers. number and locations of

	wheelchair, stretcher and UM passengers must be known and assigned to one or more responsible cabin crew. ● Make a passenger announcement according to PAH. Repeat it as necessary and include the following information: – commencement and completion of the re-/ de-fueling – smoking is prohibited – use of electronic devices is prohibited – passengers must remain seated with their seat belts unfastened. Note: In case flight operates with reduced minimum number of required cabin crew, see Appendix B—Reduced Minimum Number of Required Cabin Crew.
Ramp/GND staff	● The ramp/ground staff must closely supervise the passengers during boarding process on the ramp. ● Direct passengers directly to and from the aircraft. ● Keep passengers at the maximum possible distance from the fueling zone. ● Keep the area clear around the emergency exits. ● Ground servicing activities should be conducted in such a manner that they do not create a hazard. ● If only one fuel truck is used, position it on the right (starboard) side of the aircraft. ● Alert the flight/cabin crew, ground engineer and/ or fire service as appropriate when there is any sign of abnormal event, smell, smoke or fire.
Ground engineer	● A two-way communication must be established and must remain available between the flight crew and a ground engineer. ● Inform the flight crew of the commencement and completion of the re-/de-fueling. ● Alert the flight crew and/or fire service as appropriate when there is any sign of abnormal event, smell, smoke or fire and take appropriate actions. ● Stop re-/de-fueling upon flight crew's request

70. How do we determine the fuel freezing point when difference types of fuel are mixed?

(OM-A 8.2.1.3)

Fuel Freezing Point Determination if Mixed Fuel is Used

The freezing point of a fuel mixture varies in function of non-straight laws. Therefore, the only reliable way to obtain an accurate freeze point of a mixture of fuels is to make an actual freeze point measurement.

When this is not possible, consider the freezing point of the mixture to be the same as the highest freezing point when the fuel type in lowest **quantity** reaches 10% of the mixture.
The determination of the fuel freezing point of fuel mixtures may be particularly a concern when operating transatlantic or transpacific routes and when very low OAT are expected. This is because the aircraft has to cope with the mixture of JET A generally delivered in USA and JET A1 elsewhere.

Determination of the fuel freezing point:

- when the mixture contains less than 10% JET A, the fuel is considered as JET A1
- when the mixture contains more than 10% JET A, the fuel is considered as JET A.

Mixing all the residual JET A with all the refuel JET A1 to achieve maximum dilution is not considered practical.

To practically achieve the best dilution, all the JET A should be placed in the inner wing tanks as these have the largest volume. (This can be done by transfer of the JETA fuel from the outer tanks into the inner tanks either during the previous flight or on the ground before refueling.) Depending on the aircraft model, the inner tanks will receive fuel from the center tank early in the flight, thus further diluting the JET A.

Placing all the JET A into the inner wing tanks potentially enables a maximum dilution but does not guarantee that the mixture will be homogenous. In reality the concentration of JET A will be greater near the tank's inboard end. This is because of the compartmental structure of the inner wing tank and the fact that the residual JET A fuel will start at the inboard end of the tank.

The poor dilution of the JET A in the inner wing tank and its concentration near the inboard end of the tank has a potentially positive consequence. This is because the fuel near the inboard end of the inner wing tank tends to be consumed first by the engines.

Thus, the concentration of the remaining JET A fuel on board, later in flight, will be less than at takeoff. This is possible when you encounter low fuel temperatures because of low OATs. This gives a higher confidence margin that low concentrations of JET A in JET A1 will have a freeze point similar to JET A1 and so can be treated as JET A1 with respect to the cold fuel alert.

71. Which type of passenger does not require a seat ?

(PHM 5.4.2 p.1)

Seating for Passengers Traveling with Infants

- Passenger traveling with infant, who do not occupying individual seat, must not be seated at emergency exit.
- Seats provided with mounting facilities for bassinet shall be reserved only for passengers traveling with infants.
- Seats adjoining to the specified seats for bassinets shall be blocked and left unoccupied if the flight is not fully booked.
- When necessary, adjoining seats shall be released only to one-sector passengers, if possible.

72. In case of passengers needing immediate medical attention, what is to be done following the procedure ?

(OM-A 8.2.2.2.1, OM-A 6.3.7, PHM 10.9.1)

Serious Passenger Illness, Injury or Death in Flight

In case of serious illness, injury or death in flight, all necessary action must be taken to avoid contagion for the other persons on board. The ill person should be isolated for the comfort and the safety of the ill person and of the other passengers.

As long as the ill person is on board, first aid must be given by a cabin crew or competent passengers. And if medical assistance is needed, cabin crew shall make a special announcement over PA system and call for a doctor or a trained nurse.

If the condition of a sick passenger or a crew member is critical, it is the P-i-C's duty to land at the nearest suitable airport where proper medical care can be given. The P-i-C should make preparations

over the radio for the care of the sick person (e.g. request for doctor/ambulance). Such a situation can be considered as an "Emergency".

If no doctor or nurse is available on board, the cabin crew will ask the P-i-C to obtain medical advice via ACARS, ARINC, satellite phone or Stockholm Radio with phone patch capabilities to suitable hospitals (refer to RM/COM).

Note: Action required in the event of death on board the aircraft is specified in PHM 10.9—In-flight Irregularities.

Presumed Death on Board

In case a passenger is presumed dead during flight, the P-i-C shall notify the THAI Airport Service Manager via ACARS and ATC of the following at the next point of landing:

- full name of deceased passenger
- nationality
- date of birth
- home address
- station of embarkation
- destination
- whether the deceased passenger was accompanied by relatives/friends or not.

The Airport Service Manager immediately, giving all details, inform:

- competent local police authorities/airport authorities
- local THAI representation
- THAI medical services.

After landing, the P-i-C shall establish a report in duplicate containing the following items:

- full name of deceased passenger
- sex
- nationality
- date of birth, age
- home address
- station of embarkation
- flight number
- route leg
- number of flight hours after first embarkation
- destination
- time of presumed death
- altitude and situation of the aircraft at time of presumed death:
  - actual altitude
  - cabin pressure altitude
- cause of presumed death, if know
- circumstantial details of presumed death in accordance with report of cabin crew
- information whether passenger was ill or not.

The original of this report is to be handed over to the competent local police authorities, the copy via fleet chief pilot to Administration Flight Crews for further dispatch.
For legal and for cost aspects, Administration Flight Crew shall also contact customer relations passengers.

Deceased Passenger
Procedure and Responsibilities

In the event of passenger's death on board or during transit on the ground;

1. the Captain will report to THAI ASM at the next port of call the following particulars:
   - circumstantial details of death,
   - full name, nationality, date of birth, address, if available, airports of embarkation and destination, altitude at the time of death (actual and cabin),
   - close relative(s), friend(s), or attendant(s), who accompanies (if any).

2. the ASM shall immediately inform;
   - the relevant police and airport authorities,
   - the next of kin, if known, through the nearest THAI office,
   - the company's doctor and/or the airport doctor,
   - the embassy or consulate concerned.

3. a special report containing the following information shall be sent as soon as possible to BKKDK copy BKKKS, BKKOP, BKKJZ, BKKS4, BKKKO, BKKKP, BKKLP, General/District Managers, and ASM of line stations;
   - flight No. and date,
   - leg,
   - full name, nationality, date of birth, sex, and address of the deceased passenger,
   - the deceased passenger's health condition (reported/not reported to the cabin crew/ ground staff),
   - airports of embarkation and destination,
   - circumstantial details of death,
   - time of death, number of hours after first embarkation, and number of hours after last takeoff,
   - altitude at the time of death (actual and cabin),
   - actions taken on deceased passenger.

4. the ASM is responsible for checking overall documentations required in connection with the death.
   The police authorities will decide whether a forensic medicine examination is to be made to find out the cause of death.

5. for possible onward transportation of remains by THAI, the following procedures shall be applied:
   - as a rule, THAI will assist and coordinate the arrangement of such transportation to the point requested by the passenger's next of kin or embassy concerned.
   - if so, recalculate the fare of the unused flight coupon(s) which shall be used as part payment for the expenses in connection with the forensic medicine examination, formalities and transportation charges, e.g. cargo rates, cost for a coffin, coroner and embalmment etc. In case cremation is requested, only the cremated ashes shall be shipped in a funeral urn as required.
   - after assessment of the total expenses has been established and:
     - if expenses exceed the recalculated fare, the additional amount shall be collected from the passenger's next of kin or the embassy concerned.
     - if not exceeded, the difference (if any) shall be refunded to the passenger's next of kin or the embassy concerned according to the refund procedures.

- the transportation of the human remains shall be governed by the rules and regulations outlined in the THAI Cargo Manual (refer to TCM 7.1—Dangerous Goods) and the Load Control Manual (refer to LCM 15.3.3—Human Remains). Also consult the local cargo function/General Manager.

73. What is the difference between an Inadmissible Passenger and a Deportee ?

(OM-A 8.2.2.2.2)

Transport of Inadmissible Passengers, Deportees or Persons in Custody

Definitions	
Inadmissible passengers	A passenger who is refused admission to a country by the authorities. Airlines are responsible for passengers carried on their flights who are refused admission to a country.
Escorted inadmissible passengers	Inadmissible passengers who are deemed to pose a security and safety risk, or whose behavior or conduct may cause discomfort to other passengers shall be accompanied by the escort. The escort shall wear civilian clothes. The escort is not allowed to carry firearms and weapons in the cabin. Inadmissible passengers must not be handcuffed. The PiC shall be verbally notified of the escort of inadmissible passengers.
Unescorted inadmissible passengers	Unescorted inadmissible passengers shall be treated as normal passengers. The presence of deporting authority at the boarding areas, to monitor boarding on their return flight, shall be explained to the PiC.
Deportee(s) traveling without escort (DEPU)	Type A Person(s) was legally admitted into a country, or entered a country illegally, and is later required by the authorities to leave that country. No limitation.
Deportee(s) traveling with escort (DEPA)	Type B Person(s) is either under arrest or convicted by courts of law to be transported to another country, and will be handled as a deportee with the condition that he/she must always be escorted. Maximum 2 Type B DEPA on board. Type C Person(s) is in the custody of authorities and considered as “Dangerous Prisoner”. This type of deportee must always with escorts. Maximum 1 type C DEPA is allowed on board.

74. What are the traveling regulations for Deportees ?

(OM-A 8.2.2.2.2)

Travel Documents

Passenger's travel documents shall be put in the envelope (Form THAI 0244) and handed over to CIC upon boarding, together with pertinent details, e.g. passenger's full name, seat number, nationality, etc. The P-i-C must be informed.

At destination, CIC shall deliver the inadmissible passenger(s) and the travel document envelope to ground staff during disembarkation.

Seating

Inadmissible passengers holding or paying for return tickets shall be seated in the class they are entitled. The inadmissible passengers must not be seated at the emergency exits.

Deportee Procedures

The acceptance of deportee(s) on THAI flight is based on the following rules drawn up by THAI cooperation with the authorities of Thailand:

- THAI always reserves the right to refuse the carriage of deportees
- if the local authorities in any country are unwilling to comply with THAI policy and rules, carriage of deportees shall be refused
- THAI may/will under no circumstances absorb the cost of transportation and escort services of deportees.

Provision of Escort

Escort shall always be provided if a deportee:

- is deemed to be a security or safety risk
- behaves or conducts in a way that may cause discomfort to other passengers
- has committed unprovoked violence or other dangerous criminal acts
- objects to the deportation
- is wanted by the police in his home country or in another state, or is assumed to be arrested upon arrival at the destination
- needs guarding at intermediate or transfer station
- due to mental state or drug dependence, is considered a hazard to himself and/or other people
- will be handed over to the police authorities in the arriving country due to a criminal act.

Police Authority

The police authority has the right to initiate a security screening of all passengers and their hand baggage on a flight carrying deportees. It is the responsibility of the police authority to ensure that deportees do not carry any objects on them or in their baggage which may be used for a violent or threatening act. Furthermore the police/wardens shall present themselves with the deportee to THAI Duty Manager or deputy at least 1 hour before departure on international flights and 30 minutes on domestic flights. The police/wardens shall bring along the completed form “Notification of Deportee” in a sufficient number of copies to allow distribution to all P-i-C along the routing. And for security reasons, the police authority may not disclose the itinerary of a deportee to unauthorized persons.

Deportee(s) Traveling Regulations

Transportation of all types of deportee (A/B/C) shall be authorized by HB. Regarding carriage of deportees, the following regulations shall be applied:

- Deportee(s):
  – deportees must have a tidy appearance
  – deportees must not be served with alcohol or intoxicating beverage
- Escort(s):
  – the escort(s) shall wear civilian clothes
  – the escort(s) must not carry firearms and weapons in the cabin
  – the escort(s) shall have a good command of the English language
  – the escort(s) must keep the deportee(s) under surveillance during the whole transport
  – and the escort(s) must not be served with alcohol and intoxicating beverage
- Deportee(s) traveling without escort (DEPU):
  – only deportees type A shall be accepted to travel without escort. There is no limitation on the number of deportee type A to be accepted in the same flight
- Deportee(s) traveling with escort (DEPA):
  – deportee(s) type B and C must always travel with escort(s):
    ◦ the deporting authority shall provide escort of the deportee right through to the destination
    ◦ the deportees must not be handcuffed
    ◦ prisoners may be served food at the discretion of escorts but shall not be provided with metal utensils or a knife.
- Embarkation/Disembarkation Procedures
  Before embarkation, the police/wardens and the deportee(s) shall be arranged to meet the P-i-C. The police/wardens and deportee(s) shall board the aircraft before other passengers, and disembark after all passengers have left the aircraft.
- Seating
  If required, the deportee and escorts shall be seated in the class they are entitled according to the tickets. However, THAI reserves the right to seat the deportee and any escorts in Y–class, if the deportee's behavior and appearance are considered inappropriate for C– or F–class.
  The police/wardens and deportee shall be assigned the rearmost seats in the class of service. Under no circumstances should a deportee be seated adjacent to any normal or emergency exits and in the aisle seat. The deportee shall not be permitted to leave his seat without an escort.

75. How does THAI assign seat for Deportees ?

(OM-A 8.2.2.2.2)

Transport of Inadmissible Passengers, Deportees or Persons in Custody Seating

Seating

Inadmissible passengers holding or paying for return tickets shall be seated in the class they are entitled. The inadmissible passengers must not be seated at the emergency exits.

Deportee(s) Traveling Regulations

Transportation of all types of deportee (A/B/C) shall be authorized by RC. Regarding carriage of deportees, the following regulations shall be applied:

- Seating

  If required, the deportee and escorts shall be seated in the class they are entitled according to the tickets. However, THAI reserves the right to seat the deportee and any escorts in Y–class, if the deportee's behavior and appearance are considered inappropriate for C– or F–class.
  The police/wardens and deportee shall be assigned the rearmost seats in the class of service.
  Under no circumstances should a deportee be seated adjacent to any normal or emergency exits and in the aisle seat. The deportee shall not be permitted to leave his seat without an escort.

76. What is the procedure for passenger refusal of embarkation ?

(OM-A 8.2.3)

Procedure for Refusal of Embarkation

The P-i-C has the authority to refuse or to off-load any person at any aerodrome, if he deems the conduct, status, age or mental or physical condition of the person such that:

- he is incapable of caring for himself without special assistance of the cabin crew
- may cause discomfort or make himself objectionable to other passengers
- involves any hazard or risk to himself or to other persons, to property or to the aircraft
- he fails to observe the instructions of the crew
- person under the influence of drugs
- except persons who are subject to such condition following emergency medical treatment after commencement of the flight, or to persons under medical care accompanied by personnel trained for that purpose.

Whenever it becomes necessary to remove a passenger from an aircraft, the flight crew shall inform the local company representative who shall take the necessary actions.

Passengers who have been refused embarkation, or who have been disembarked are left with the airport authorities.

77. What shall be done in the event those fire/overheat tires ?

(OM-A 8.2.2.5.5)

Severe Brakes Overheat or Fire

If the fuse plugs melt, as a result the tires will deflate. This should prevent the tire and wheel from bursting.

WARNINGS: 1. If a tire is deflated, do not go near the area around the wheel for about one hour.
2. Go from the front or rear and not from the side of the wheel.

If there is no fire, do not apply the extinguishing agent (liquid, water, mist, foam etc.) with a spray gun onto a hot tire as long as it is inflated.

Do not apply the extinguishing agent directly into the heat pack of the brake or into the wheel. This can cause thermal shock to the stressed parts. Especially, do not use CO_2 as this has a strong cooling effect which is not the same in all areas. It can cause an explosion in the stressed parts.

Extinguishing on hot wheels can:

- increase the time necessary for the fuse(s) to melt or
- prevent operation of the fuse(s).

Let the brake cool by itself for at least one hour and use the cooling fans (if installed).

Note: You can use blowers or air conditioning equipment only after the temperature of the fuses decreases (more than one hour after the aircraft stops) or the fuses are melted. Do not use blowers if flames or burning ambers are visible.

For brake fire:

- call fire brigade—get help
- stop the fire
- do not wait until the tires are deflated
- come near the wheel only from the front or from the rear
- do not use multi-purpose powders
- do not apply the parking brake
- put a warning notice in the cockpit to tell persons not to operate the landing gear control lever
- put the wheel chocks in position
- clean all the parts if extinguishing agents were used.

78. How many anti-icing fluids are there ?

(OM-A 8.2.5.2)

Anti-icing Fluids

These are fluids which are used for de-icing as well as for anti-icing. Depending on their characteristics, anti-icing fluids are divided into different types with quite different anti-icing properties:

Fluid Types	Characteristics
Type I	Form a thin liquid wetting film rather limited Hold-Over Time (HOT). In precipitation, they are quickly diluted and give short HOT are always mixed with water The fluid/water mixture is selected to maintain freezing point at least 10 deg. C below OAT. Increasing the fluid concentration does not improve HOT.
Type II	Contain a thickener and form a thicker film adhering to the aircraft surfaces fluids provide improved HOT especially under precipitation compared to type. 1 Before lift–off, the viscosity is drastically reduced by shear forces, allowing the fluid to run off the wing (NOT on certain turboprop aircraft) are used undiluted or diluted with water and are identified according to the mixture ratio: ● “type II 75" is a mixture of 75% (by volume) ● type II fluid with 25% water ● higher concentrations allow use down to lower temperatures and improve HOT.
Type III/Killfrost	Not used by THAI.
Type IV	Similar to Type II, but provide even better HOT when used undiluted or slightly diluted.

79. What are criteria for freezing condition ?

(OM-A 8.2.5.2)

Freezing Conditions

Conditions in which the outside air temperature is below +3 ºC (37.4 ºF) and visible moisture in any form (such as fog with visibility below 1.5 km, rain, snow, sleet or ice crystals) or standing water, slush, ice or snow is present on the runway.

80. What are the representative surface regarding de-/anti-icing procedures ?

(OM-A 8.2.5.2)

Representative Surface is any surface of the aircraft, visible from the flight deck and de-/anti-iced equally as the critical surfaces, which can be checked, in lieu of the critical surfaces, when performing the Pre-takeoff check.

81. What is a hold-over time (HOT) ?

(OM-A 8.2.5.2)

Hold-over Time (HOT)

HOT is the estimated time the anti-icing fluid will prevent frost, ice and snow to form or accumulate on the protected (treated) areas of the aircraft.

Caution: HOT starts at the beginning of the final anti-icing treatment.

A HOT table is published in RM/PFL, giving HOT as function of applied fluid, temperature and weather.

For each condition the table gives a range of HOT (e.g. 30-45 minutes) and it is the responsibility of the P-i-C to determine what HOT can be expected under prevailing conditions,
see OMA 8.2.5 —De-/Anti-icing.

82. Explain criteria for icing condition ?

(OM-A 8.2.5.2)

Icing Conditions

May be expected when the OAT (on the ground and for takeoff) or when TAT (in flight) is at or below 10 ºC, and there is visible moisture in the air (such as clouds, fog with low visibility of one mile or less, rain, snow, sleet, ice crystals) or standing water, slush, ice or snow is present on the taxiways or runways (AFM definition).

Icing conditions should be expected in clouds down to –20 ºC. Below that temperature, icing conditions encountered should be less than severe, but the risk remains down to –60 ºC.

Light Freezing Rain: A precipitation of liquid water particles which freezes upon impact with exposed objects, in the form of drops of more than 0.5 mm (0.02 inch) which, in contrast to drizzle, are widely separated. Measured intensity of liquid water particles are up to 2.5 mm/hour (0.10 inch/hour) or 25 grams/dm2/hour with a maximum of 2.5 mm (0.10 inch) in 6 minutes.

WARNING: Icing conditions, even with OAT below –40°C, may exist and can be dangerous, especially in vicinities of thunderstorms due to the presence of super cooled water.

Nomenclature:
The words "Light", "Medium" and "Heavy" aircraft icing conditions as used by FAA in the USA when approving U.S.–built aircraft, are scientific terms based upon the liquid water content in clouds and also the mean effective drop diameter and ambient air temperature and have consequently no relation to the definitions in AIREP.

The terms "Light", "Moderate" and "Severe" icing used at meteorological briefing and in meteorological warning messages should correspond, as far as possible, to the definitions in AIREP. Meteorologist may have obtained information from aircraft in flight or made estimation from previous experiences. If not stated, and the P-i-C deems it necessary, he should inquire from what type of aircraft the reports of icing have been received.

83. What shall pre take off check to be done in freezing condition ?

(OM-A 8.2.5.2)

Pre-takeoff Check

Pre-takeoff Check is the P-i-Cs final check that the aircraft is free from frost, ice and snow before takeoff. It shall be performed within 2 minutes of commencing takeoff roll whenever conditions are such that frost, ice and snow might have accumulated on the aircraft after the de-/anti-icing treatment.

84. Compare the change of altimeter settings from QNH to STD and STD to QNH during climb and descent ?

(OM-A 8.3.3.2)

Setting Procedure and Callout

Caution: A clear distinction shall be made between the terms “Flight Level” and “Altitude”, especially when reading back clearances and when reporting positions.

Note: The meter altimeter is used only with STD (1013.2 hPa) where applicable

Procedure

The pressure scales of the feet altimeters shall be set to the following values:

Takeoff and initial climb	Both feet altimeters set to the applicable QNH for the departure airport.
Climb	Set altimeters to STD (1013.2 hPa) when penetrating the transition altitude. Baro settings and altitude readings will be cross-checked.
Cruise, descent, approach and landing	Maintain standard setting when at or above the transition level. If below or at transition altitude, both pilot altimeters will be on QNH of the nearest station available. Set the applicable QNH no later than when penetrating the transition level during descent. When cleared to an altitude below the transition level and provided no further reference to flight level(s) is indicated or anticipated, for terrain precaution, the change in altimeter settings should be made well in advance of reaching the transition level.
Missed approach	The altimeter settings depend on whether the procedure can be completed below the transition altitude. The settings shall be consistent with the procedures stated above.

85. What actions should we take against GPWS warnings ?

(OM-A8.3.5.5)

GPWS Pull-up WARNING

Whenever a pull-up WARNING occurs in IMC, a recovery shall be initiated without delay as follows:

- immediately apply max thrust
- disengage autopilot
- disengage auto throttle
- increase pitch altitude initially to 15 deg. C Nose-up or as stated in the respective FCOM
- if stick shaker is activated, reduce rotation, as necessary
- do not change configuration
- thrust may be increased up to mechanical stops if situation so warrants
- increase pitch to silence the pull-up WARNING and/or to avoid terrain contact.

When WARNING stops and ground contact is no longer imminent, accelerate and adjust configuration as required.

In case of a pull-up WARNING in Daylight and VMC and positive visual verification can be made so that no hazard exists, the descent/approach may be continued.

86. What are the actions required after lightning strike ?

(OM-A 8.3.8.2)

Lightning

- A lightning strike can puncture the skin of an aircraft.
- Nearby lightning can blind the pilot rendering him momentarily unable to navigate either by instrument or by visual reference.
- Lightning can also induce permanent errors in the magnetic compass and lightning discharges, even distant ones, can disrupt radio communications on low and medium frequencies.

Procedure in Case of Lightning Strike

In flight:

- check of all radio communication, navigational equipment and the weather radar.
- record the lighting strike in the technical logbook.

On ground:

- check the Compensation of the (standby) compass
- signs of damage on fuselage, wings, radom, empennage, Antennas and pitot heads
- all control trailing edges and static dischargers
- radio and navigation equipment.

87. How is turbulence intensity defined ?

(OM-A 8.3.8.4.2)

Turbulence Classification of Intensity and Cabin Conditions

	Light Turbulence	Moderate Turbulence	Severe Turbulence
Aircraft Reaction	Slight, erratic changes in altitude and/or attitude (pitch, roll, yaw).	Changes in altitude and/ or attitude occur but with more intensity than light turbulence.	Large, abrupt changes in altitude and/or attitude. Usually causes large variations in airspeed.
Cabin Conditions	• Liquids are shaking but are not splashing out of cups. • Little difficulty in walking or standing. • Carts can be maneuvered with little difficulty. • Passengers may feel a slight strain against seat belts.	• Liquids splashing out of cups. • Difficult to walk or stand without balancing or holding to something. • Carts are difficult to maneuver. • Passengers feel definite strain against seat belts.	• Items falling over, unsecured objects are tossed about. • Walking is impossible. • Carts are unable to controlled. • Passengers are forced violently against seat belts.

Note: When the level of turbulence so requires, and in the absence of any instructions from flight crew, CIC should be entitled to discontinue non-safety related duties and advise the flight crew of the level of turbulence being experienced and the need for fasten seat belt signs to be switched on. This should be followed by the cabin crew securing cabin and other relevant areas if the situations so permit.

88. What is the required landing runway length ? and how is the landing distance determined ?

(OM-A 8.3.8.12.1)

Runway Friction Characteristics

Landing:

- be aware that where rain, hail, sleet or snow showers are encountered on the approach or have been reported there is a high probability of the runway being contaminated
- check the runway state with ATC before commencing or continuing the approach
- use of reverse thrust on landing on dry snow in very low temperatures will blow the dry snow forward especially at low speed. The increase in temperature may melt This snow and form clear ice on re-freezing on static ports
- the required landing field length for dry runways is defined as 1.67 times the demonstrated dry landing distance
- for wet runways, This landing distance requirement is increased by 15%
- the required landing field length for contaminated runways is defined as 1.15 times the demonstrated contaminated landing distance
- the shortest stopping distances on wet runways occur when the brakes are fully applied as soon as possible after main wheel spin up with maximum and immediate use of reverse thrust
- do not land on contaminated runways without antiskid

- use the auto brake (if available)
- do not land where appreciable areas of the runway are flooded or covered with ½ inch or more of water or slush
- limit crosswind components, see OM-A 8.9.11-Landing; Company Crosswind Limit for Landing
- establish and maintain a stabilized approach.

89. Is the effect of reverse thrust used in the takeoff and landing performance calculation ?
(OM-A 8.3.8.12.1)

Guidelines for Operations on Slippery Surfaces
General consideration is the use of Thrust Reversers Which is Mandatory on Contaminated Runways.
The 2 most important variables confronting the pilot when runway coefficient of friction is low and/or conditions for hydroplaning exist are:

- length of runway and
- crosswind magnitude
- in crosswind conditions, a longer distance will be required to stop the aircraft.

Taxi:

- aircraft may be taxied at the P-i-C discretion on ramps and taxiways not cleared of snow and slush
- more power than normal may be required to commence and continue taxi so care should be taken to avoid jet blast damage to buildings, equipment and other aircraft
- the boundaries/edges of maneuvering areas and taxiway should be clearly discernible
- if in doubt, request "Follow me" guidance
- reduce taxi speed as braking and steering capabilities are greatly reduced with icy airport conditions
- delay Slat/flap selection until immediately before line up to minimize contamination.

Takeoff:

- severe retardation may occur in slush or wet snow
- lack of acceleration will be evident early on the takeoff run
- maximum permissible power must be used from the start
- large quantities of snow or slush, usually containing sand or other anti-skid substances may be thrown into the engines, static ports and onto the airframe
- check Pod and engine clearance when the runway is cleared and snow is banked at the sides of runway or taxiway.

Landing:

- be aware that where rain, hail, sleet or snow showers are encountered on the approach or have been reported there is a high probability of the runway being contaminated
- check the runway state with ATC before commencing or continuing the approach
- use of reverse thrust on landing on dry snow in very low temperatures will blow the dry snow forward especially at low speed. The increase in temperature may melt This snow and form clear ice on re-freezing on static ports
- the required landing field length for dry runways is defined as 1.67 times the demonstrated dry landing distance
- for wet runways, This landing distance requirement is increased by 15%

- the required landing field length for contaminated runways is defined as 1.15 times the demonstrated contaminated landing distance
- the shortest stopping distances on wet runways occur when the brakes are fully applied as soon as possible after main wheel spin up with maximum and immediate use of reverse thrust
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- do not land where appreciable areas of the runway are flooded or covered with ½ inch or more of water or slush
- limit crosswind components, see OM-A 8.9.11-Landing; Company Crosswind Limit for Landing
- establish and maintain a stabilized approach.

Consider the following variables involved before landing on a slippery runway:

- landing weather forecast
- aircraft weight and approach speed
- landing distance required
- runway surface condition and braking action (refer to GWC, FCOM or performance applications of each aircraft type for the description)
- hydroplaning (aquaplaning) speed
- condition of tires
- brake characteristics (anti-skid, autobrake mode)
- wind effects on the directional control of the aircraft on the runway
- runway length and slope
- glidepath angle.

90. When shall shoulder harness and its locking devices be used ?

(OM-A 8.3.11.1)

Flight Crew

- Both occupants of the pilot seats shall always have their seat belts fastened.
- Shoulder harnesses shall be fastened during takeoff and landing and during turbulence or when turbulence is expected.
- Where locking devices are installed, they shall be used to protect the pilots in such emergency situations as emergency landing on land or ditching.

***Note**: Other flight crew member(s) or any person who is in the flight deck during takeoff, landing, turbulence or when turbulence is expected shall have their seat belts and shoulder harnesses fastened, unless the shoulder harnesses interfere with the performance of duties. In such case, the shoulder harnesses may be unfastened but the seat belts shall remain fastened.*

91. Can the Cabin Attendants continue their services when the fasten seat belt sign is turned on during turbulence ?

(OM-A 8.3.11)

Restraint Devices: Use of Safety Belts for Crew and Passengers
Use of Seatbelt Sign

Seat belt sign can be used to communicate with cabin crew as follows:

- to advise cabin crew to prepare for takeoff/landing by switching seatbelt sign off then on:

– approximately 30-60 sec before takeoff
– approximately 3 min before landing

- to advise cabin crew to secure the cabin before landing:
  – approximately 10 min before landing
  – in case cabin crew require more than 10 min to secure the cabin, then the P-i-C shall be informed
- to inform cabin crew and passengers when turbulence is expected. Cabin crew shall stop services, secure loose equipment, take their seats and fasten their seat belts. In case cabin crew cannot take their assigned seat, the nearest passenger seat can be used instead.

Cabin Crew

During taxiing, all cabin crew should remain seated with seatbelt fastened unless there is a safety related occurrence in the cabin.

During takeoff/landing, all cabin crew should remain seated with seat belt fastened in brace position.

During flight in turbulent air or when turbulence is expected while “FASTEN SEAT BELT” sign is ON, cabin crew shall return to the assigned seat or occupy passenger seat and fasten seat belt.

The CIC must ensure that all passengers have conformed to the P-i-C's instructions on fastening of seat belts.

92. Who may apply for permission to visit and/or to travel on the flight deck even without cabin seat available ?

(OM-A 8.3.12)

Policy of Admission to the Flight Crew Compartment

Persons other than active flight crew may be allowed to enter or travel on the flight crew compartment with prior permission of the P-i-C who has the sole authority to decide who may visit or travel in the flight crew compartment with or without cabin seat(s) available. The final decision regarding the admission to the flight crew compartment shall be the responsibility of the P-i-C.

Admissible Persons to the Flight Deck

The P-i-C shall ensure that no person, other than the flight crew member assigned to a flight, is admitted to, or carried in, the flight deck unless the person is:

- a crew member in the performance of his or her duties
- a competent official on duty who is responsible for certification, licensing or inspection
- a person required to be in the flight deck compartment for technical, operational, training, or official flight deck familiarization reasons formally authorized in accordance with the Operations Manual
- a person issued with Flight Deck Permit
- a person employed by THAI or his/her family member traveling on concession ticket who, under the P-i-C's discretion, does not cause distraction or pose any threat to safety and security of flight operations.

Admission Procedures

The P-i-C shall ensure that:

- in the interest of safety, admission into the flight deck does not cause distraction and/or interfere with the flight's operations
- a seat with safety belt/safety harness is available
- requirements concerning supplemental oxygen are met
- all persons carried on the flight deck are made familiar with the relevant safety and security procedures and use of all flight deck emergency equipment and all relevant emergency procedures to use seat belts, emergency exits, life jacket and oxygen
- the instructions, not to distract and/or interfere with the operations of the flights and not to touch any controls, switches, instruments, circuit breakers have been given to the persons
- the persons, while seated, shall keep the safety belt/safety harness fastened at all times
- appropriate procedures should be given to the persons and crew for handling drinks and other items in the flight deck
- in case of admission to the flight deck is refused by P-i-C to a competent official on duty or a person issued with a Flight Deck Permit, the P-i-C shall submit a written report explaining the reason for the refusal as soon as possible after the flight, to the Vice President, Flight Operations (DP) for further report to Executive Vice President, Operations (DO) who will forward the report together with the Company's comment to the authorities concerned.

93. What is defined by the term pilot incapacitation and how can it be detected ?

(OM-A 8.3.14)

Incapacitation of Crew Members

General

Incapacitation is defined as any physical or mental condition that renders a crew member incapable of performing normal or emergency procedures. Incapacitation may be obvious—usually involving prolonged maximum loss of function, or subtle-usually transient and involving partial loss of function.

Detection of Incapacitation

Be highly suspicious of a subtle incapacitation whenever a pilot does not respond appropriately to repeated verbal communication.

Failure to:

- perform closed loop CRM procedures
- fly precisely standard flight profiles
- proper monitor and strict adherence to standard operational procedures
- provide clues for early detection of a serious incapacitation.

WARNINGS: 1. Incapacitation can come slowly.

2. The slowly incapacitating pilot may "feel well" and will, in extreme cases refuse to be taken off the controls. Get Cabin Crew help to secure such a pilot.

Actions

- Fly the aircraft (aviate).
- Navigate.
- Communicate—an incapacitated pilot on a 2 man aircraft requires a "MAYDAY" call.

When the P-i-C is incapacitated, the pilot in succession (Relief P-i-C, First Officer) assumes command.

Total Incapacitation

- Remove the incapacitated pilot as soon as possible from this seat.
- Pull this seat back and tilted so as to avoid interference with the control of the aircraft.
- Lock this shoulder harness.
- Land at the nearest suitable airport where proper medical care can be given.

Partial or Subtle Incapacitation

- Relieve the incapacitated pilot of all responsibility.
- Other actions required to be taken will depend on the type, seriousness and duration of the incapacitation.

Post-flight Actions

The P-i-C (or the pilot in succession of command when the P-i-C is incapacitated), is responsible for:

- ensuring that the incapacitated pilot receives appropriate medical care
- filing a ASR/ASRTEX
- briefing the other crew members

94. What are the actions required in case of a pilot incapacitation ?

(OM-A 8.3.14)

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95. What devices are acceptable to be used on board for every phase of flight ?

(OM-A 8.3.15.9)

Portable Electronic Devices (PED)

Any PED are not permitted to use on board the aircraft when its use may interfere, or is suspected to interfering, with the performance of the navigation and communication system of the aircraft.

The use of a PED for voice communication on board an aircraft is not permitted except when the aircraft has exited the runway after landing.

The P-i-C has a right to terminate the use of any PED.

PED Categories

Intentionally Transmitting PED	Unintentionally Transmitting PED
Radio transmitter	Portable video equipment
Walkie-talkie	Laptop or portable PC without printer
Portable radio controlled toys	Cassette/CD/DVD/Mini Disc players (used with headphones only)
Radio and television receivers	Electronic games
Citizen band radios	Electronic calculators
Pagers	Electric shavers
Electronic toys	MP3 players (used with headphones only)
Wireless devices (mouse, Bluetooth, etc.)	Mobile/cellular telephones, only when set to flight mode or Airplane mode
Mobile/cellular telephones	

***Notes**: 1. An intentionally transmitting PED means a PED that intentionally transmits electromagnetic signals.*

2. An unintentionally transmitting PED means a PED that emits electromagnetic signal as a by-product of its operation.

96. How do we handle the oxygen bottles for medical use ?

(OM-A 8.3.15.13)

Portable 310-liter/120-liter Oxygen Bottles

- The cabin crew removes oxygen bottles and masks from various locations in the cabin when requested so.
- Make sure that at least one bottle remains in each cabin zone and one remains at required cabin crew station (minimum requirement). This is to ensure the required bottles availability throughout cabin.
- Bring one bottle at a time to the passenger/escort, give instruction how to use.
- Make sure that the pressure drops not be lower than 150 psi after use for maintenance reasons.

***Note**: For Standard quantity of portable Oxygen bottles in cabin, see OM-A 8.8.3—Portable Oxygen Bottles on Board.*

Securing the Bottle/Unit

The bottle/unit shall be secured during the use. Securing methods is as follows:

- stow the bottle/unit in overhead bin
- stow the bottle/unit on the floor against the bulkhead behind the seat
- fasten the bottle/unit with the seat legs using extension belts that are available on board.

After Use

After use, CIC shall:

- enter in Aircraft Log reporting which bottles have been used
- return used bottles to the original locations.

97. What is minimum portable oxygen bottles requirement for your aircraft type ?

(OM-A 8.8.3)

Portable Oxygen Bottles on Board

Standard Quantity of Portable Oxygen Bottles in Cabin

Aircraft type (Version)	Pax seats	Min cabin crew	Quantity of oxygen bottles carried on each flight					
			Required		Spare		Total	
			310-ltr	120-ltr	310-ltr	120-ltr	310-ltr	120-ltr
777-300ER (77B1)	348	10	10	-	8	-	18	-
777-200ER (77E1)	292	8	8	-	12	-	20	-
787-8 (7872)	256	8	8	-	12	-	20	-
787-9 (7891)	298	8	8	-	12	-	20	-
A350-900 (3591)	321	8	-	8	6	-	6	8

Notes:

- For A380-800, the total quantity of oxygen bottles in the above table excludes one 310-liter bottle in flight deck and one 310-liter bottle in CCRC.
- Passengers are not allowed to carry on board portable oxygen bottles. If for physical reasons, it is deemed necessary to administer oxygen to a passenger at any time during flight, available portable oxygen bottles can be used. For first aid treatment, 4-liter-per-minute oxygen flow is recommended

- The 310-liter portable oxygen bottle can replace the 120-liter portable oxygen bottle and can be considered as "required" number of portable oxygen bottle to be on board, when any 120-liter portable oxygen bottle is inoperative.

98. What are the conditions for replanning in flight ? (OM-A 8.3.7)

In-flight Fuel Management

Re-planning may be done throughout the flight when the planned operating conditions have changed so much that further adherence to the original flight plan is unacceptable or impractical.

Especially when using the Reduced Contingency Fuel or Pre-Determined Point procedure a careful fuel check by both pilots will be necessary in order to determine whether a flight can continue to the commercial destination or isolated airport. The following must be complied with:

Fuel Check when using RCF or PDP procedure

Commercial Destination RCF (Reduced Contingency Fuel)	Isolated Airport PDP (Pre-Determined Point) Procedure
In order to proceed to the Commercial destination	In order to proceed to the Destination airport
P-i-C must ensure that the usable fuel remaining at the Decision Point is at least the total of	P-i-C must ensure that the usable fuel remaining at the PDP is at least the total of
Trip fuel from the decision point to the Commercial destination	Trip fuel from the PDP to the destination airport
Contingency fuel equal to 5% of trip fuel from the decision point to the Commercial destination	Contingency fuel from PDP to destination airport
In order to proceed to the Commercial destination	In order to proceed to the Destination airport

If it appears en route that the fuel remaining is such that the fuel at destination will be less than expected above, the P-i-C should consider the following:

- decrease aircraft speed (down to Max Range Speed)
- obtain a more direct route
- fly closer to the optimum FL (taking the wind into account)
- select a closer "suitable" alternate airport
- land and refuel.

Re-planning during flight is normally done by the P-i-C
Flight dispatcher may be contacted for assistance. The verification of agreement between the P-i-C and flight dispatcher shall be recorded by means of electronic method, e.g. ACARS. P-i-C should request ATC assistance.

Re-planning shall be carried out when:
Anticipated circumstances may result in landing at the destination airport with less than either:

- the final reserve fuel plus any fuel required to proceed to an alternate airport
- the fuel required to operate to an isolate airport
- the weather conditions at the destination/secondary destination or alternate(s) make a landing uncertain

– fuel penalties due to ATC restrictions or unfavorable winds exceed contingency fuel and extra fuel, if carried
– the runway conditions hinder landing at the destination/secondary destination or alternate(s)
– the aircraft performance is seriously impaired by malfunctions
– the holding time at the destination/secondary destination is expected to exceed that for which fuel is available.

After re-planning, the remaining fuel must be enough for the flight to proceed to the airport of intended landing from the re-planning position without infringing the minimum fuel requirements.

99. Can a flight be replanned without alternate?

(OM-A 8.3.2.5.2)

In-flight Re-planning
Re-planning without Alternate
Proceeding to the destination, while en route or holding overhead destination, without diversion fuel may be done if all the following are fulfilled:

- flight time to the destination is 1 hour or less, and
- at least 2 separate runways meeting the landing requirements for the aircraft type are available, and
- estimated usable remaining fuel upon landing is not less than the Final Reserve Fuel, and
- the actual and forecast meteorological conditions at the destination until one hour after ETA shall permit the approach and landing under visual meteorological conditions, i.e. visibility of at least 5 km with distance from cloud of at least 1,500 m horizontally and 1,000 ft. vertically. Significant crosswind shall also be considered, and
- there are no known or probable ATC delays for the period from ETA to ETA plus one hour.

100. May we disregard the forecast weather, which is below minimum required, and take the actual weather instead for replanning ?

(OM-A 8.3.2.5.2)

In-flight Re-planning
Re-planning with Alternate:
Change of Destination
If a new destination is required for the continuation of the flight, a re-planning has to be done according to the flight planning procedures.

If flight time to the new destination is 1 hour or less, the actual weather at that destination can be used for a re-planning even if the forecast at ETA is below applicable landing minima.

101. What is a sterile flight deck and when does it come into effect ?

(OM-A 8.3.19.2)

Sterile Flight Deck
During critical phases of flight, no flight crew member should perform any duties that are not required for the safe operation of the aircraft.

Duty such as attending to call on CUT, Datalink or PA announcement from flight deck should be kept to minimum. Distraction activities and conversation or visits to flight deck by cabin crew or interphone calls are not allowed. However, there are some situations that permit flight deck intervention such as:

- fire, burning odor or smoke in cabin
- medical emergency
- unusual noise or vibration
- fuel or other fluid leakage
- cabin door malfunction
- extreme temperature change
- suspicious baggage
- any other abnormal conditions that cabin crew believe the P-i-C should know about.

Critical phases of flight in this respect include aircraft moving under own power on ground, takeoff and landing and all flight operations below 10,000 ft except cruise, or when "FASTEN SEAT BELT" sign is ON. At this stage, non-safety related items such as information regarding catering, misconnected baggage, wheel chair requirement, passenger accommodation, unruly passengers which do not jeopardize immediate safety of the aircraft are not allowed to interrupt flight crew.

102. When is the VOR not recommended for auto-tuning? How can a bearing error be checked between two VOR systems ? (OM-A 8.3.2.2)

Conventional Navigation Procedures

Conventional navigation procedures are based on the availability of satisfactory ground navigation aids infrastructures. VOR, DME, NDB and aircraft navigation systems enable NAVAID to NAVAID navigation. The airspace are expected to be saturated in certain areas due to large safety/separation margins.

Use of VOR System

- Takeoff
  When applicable the system(s) shall be selected to VOR stations suitable for track guidance and cross-bearing prior to takeoff. Automatic tuning is not recommended.
- En Route
  When using VOR systems for track guidance, tune both VHF NAV receivers continuously for tracking.
  For necessary cross-bearings, retune one of the sets as appropriate. If automatic tuning is available, monitor the correct operation of the system.
- Instrument Approach
  With dual VOR systems, both systems shall be selected to the VOR station used for approach and set in accordance with The procedures laid down in the respective FCOM.

  Utmost care shall be exercised when making the settings and both pilots shall check and crosscheck.

  Note: - as the monitor only removes the navigation information from VOR signal, it may still be possible to receive voice identification transmission after the flag warning has appeared

- a bearing error in the airborne receiver will, however, not result in flag warning. Therefore, always check one system against the other if there is a deviation of more than 4° between the systems. The system that has the bearing error can be determined by reference to approach charts.

103. In principle, how many types of ILS ground installations are used ?

(OM-A 8.3.2.2)

Use of ILS System

System Characteristics.

In principle, two types of ILS ground installations are used:

- the Omni-directional or broad beam localizer normally of CAT I performance
- the directional or narrow beam localizer normally of CAT II and CAT III performance.

104. How is the ILS identified ?

(OM-A 8.3.2.2)

Use of ILS System

- System Limitations

  The ILS may suffer from false beams outside the coverage sectors due to reflections from terrain and/ or obstacles. For that reason, the ILS signals shall be considered unreliable outside these sectors although a flag warning may not appear.

  The ILS beams may be subject to fluctuations due to reflections from moving vehicles and aircraft in the vicinity of the transmitting antennas. Such fluctuations are normally of high frequency and of short duration.

  Though technical criteria are laid down as regards the quality of the ILS radiation, certain variations in the beam pattern may be observed from one installation to the other and even on the same installation as a function of time. Such discrepancies, even if within established tolerances, may adversely affect the aircraft system performance in the auto-coupled mode. When an ILS is subject to maintenance, as announced by ATS , the facility shall not be used although instrument indications appear normal. The ILS is identified by the identification signal transmitted by the localizer. When the localizer is subject to maintenance, the identification signal will be suppressed.

  If, however, only the glide slope is subject to maintenance, the identification signal is still transmitted normally by the localizer.

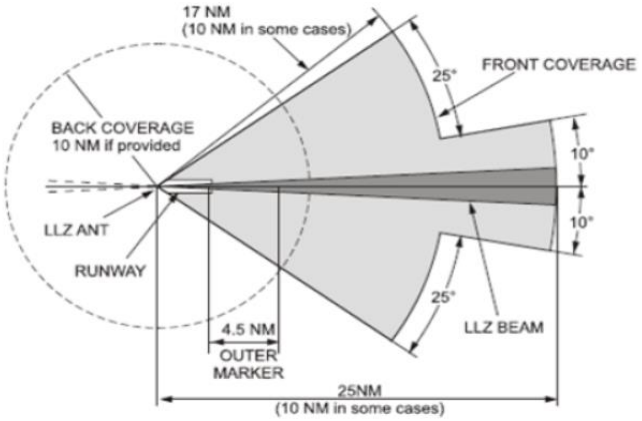
105. What is the coverage sector for localizer and glide path ?

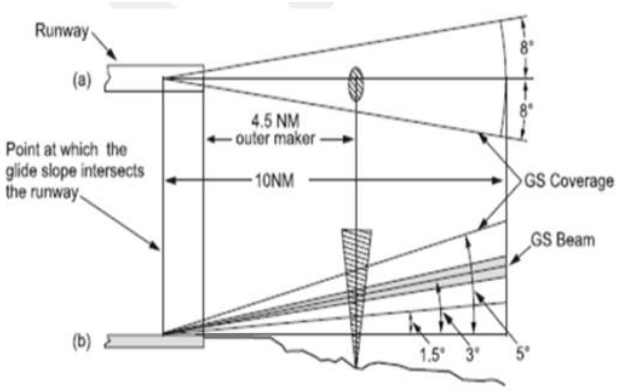
(OM-A 8.3.2.2)

Use of ILS System

The localizer coverage sector extends to a minimum of 17 NM within ±35° of the extended centerline of the runway.

The glide slope coverage sector extends to a minimum of 10 NM within ±8° of the extended centerline and within approx +2°/–1.5° of the nominal glide slope angle.





The ILS beam integrity is not guaranteed outside these coverage sectors with the exception of the omnidirectional type of localizer in which case a back-course approach may be provided.

The Threshold Crossing Height (TCH) shall be 50 ±10 ft, with the glide slope transmitter no less than 300 m from runway threshold.

106. What are the conditions to follow the ILS below 1,000 feet ?

(OM-A 8.3.2.2)

ILS front-course Procedures

Since the ILS coverage sector is limited, it is essential that navigation in a terminal area be carried out on available VOR, VOR/DME, and NDB or by radar vectoring until position is established at a gate where unambiguous ILS signals are received.

Autopilot and/or flight director systems should not be “armed” for ILS until such a position has been verified.

Instrument descents below 1,000 ft AGL, utilizing ILS shall only be made when the following conditions are fulfilled:

– before intercepting the localizer:
- identification is verified
- aircraft position is confirmed within the ILS limitation sectors, normally no more than 10 NM from touchdown.

– before following the glide slope:
- aircraft is established on the localizer.

– at OM or equivalent position:
- check the passing altitude to confirm correct glide slope. The instrument descent may be continued for glide slope check, even if OM or equivalent position is located below 1,000 ft AGL

– throughout the instrument approach:
- indications on the receiver being followed are monitored by reference to the other receiver whenever possible and by reference to other navigational aids enabling a check of correct aircraft alignment and altitude
- glide slope display does not indicate more than one dot “Low” or less in accordance with FCOM

- observe flag warning for the minimum equipment required for the type of approach.

Note: Special regulations apply for wide-bodied aircraft.

In order to ensure sufficient wheel clearance, the following applies:
– TCH less than 47 ft: cross threshold at 1 dot above glide slope (= 6 ft extra clearance)
– TCH 47 ft or more: never cross threshold below glide slope.

107. What are the ILS ground monitoring systems ?

(OM-A 8.3.2.2)

Use of ILS System

- Ground Monitors
  The ILS beams are automatically and continuously monitored to ensure radiation within prescribed tolerances.
  The monitoring system provides a warning to the ATC unit and removes navigation and identification components, should a significant shift occur to the localizer or glide slope beams. Similar action is initiated by the monitoring system in case of reduction in power output. Monitoring action is delayed 10 seconds for CAT I, 5 seconds for CAT II and 2 seconds for CAT III ILS. These time periods must never exceed limits and are intended to protect aircraft on final approach against erroneous ILS guidance.

108. What do you do when failure or degradation of B-RNAV is detected ?

(OM-A 8.3.2.3.1)

Flight Management System (FMS) and Area Navigation System (RNAV)
Aircraft equipped with FMS or RNAV are authorized to use these systems for en route and terminal area navigation in accordance with respective FCOM. Functioning FMS/RNAV is a requirement for navigating along ATS routes based on area navigation.

The navigation computer is NAVAID updated when signals from at least two DME's or one VOR/DME are available. In aircraft equipped with Inertial Reference Systems (IRS) the navigation computer is primarily NAVAID updated, but outside VHF-NAV range the computer will be updated by the IRS.

The VHF-NAV may be used in accordance with FCOM for cross-checking FMS/RNAV performance without checking and monitoring the identification signal as required.

If the FMS/RNAV is NAVAID updated it may be used for navigation to maintain terrain clearance and to comply with OM-A requirements for check of correct position.

Aircraft equipped with IRS may use FMS/RNAV for en route navigation without NAVAID update, if the progress of the flight is verified by means of other NAVAID.

When the failure or degradation is detected before departure the aircraft is permitted to make one flight to an aerodrome where repair can be made. BKKOW or responsible office will provide crew with a new Company flight plan and file an ATS plan via a VOR/DME/NDB defined routing.

If no RNAV equipment are installed the phase "Negative-RNAV" shall be included by the pilot immediately following the aircraft callsign whenever initial contact on an air traffic control frequency is established.

In case a B-RNAV equipped aircraft experience failure or degradation of the B-RNAV system, the aircraft is permitted to proceed if able to continue operations in accordance with the current ATC clearance. If unable, a revised clearance shall be obtained from ATC.

109. How the ADF should set for departure and for approach ?

(OM-A 8.3.2.2)

ADF

In order to avoid misunderstanding, ADF 1 shall also be named RED (LEFT) and ADF 2 shall also be named GREEN (RIGHT) depending on aircraft type when applicable.
PF shall order station(s) to be tuned in case he does not exceptionally handle the ADFs himself. Do not change to other stations without PF's order or consent.

When PF is going to use an ADF tuned by PM, he shall make sure that the ADF is tuned correctly.

PM shall inform PF when the tuning is completed and also of any abnormal behavior of the ADF.

- Takeoff
  Prior to takeoff, RED (ADF 1/LEFT) should be tuned to a station suitable to facilitate the keeping of the prescribed track and GREEN (ADF 2/RIGHT) to a station usable for approach in case an immediate return is necessary.
  The above procedure shall be considered the normal standard, but may be changed on the P-i-C's discretion, e.g. if the two ADFs are needed during climb in accordance with departure procedures.

- En Route
  Whenever an ADF is used for establishing an en route position, the following shall be observed:
  – the ADFs shall be monitored frequently by listening and the tuning shall be readjusted if required. If the indication seems unreliable, recheck that it is correctly tuned and identified
  – if a 180 deg. error is suspected, make a check by using the other ADF, by means of cross bearings from other stations, or when possible, by flying another heading until the location of the station can be determined by the increase or decrease in magnetic bearing.

  On aircraft equipped with automatic tuning, pilots must monitor that the tuning is correct regarding stations and frequencies.

- NDB Approach
  Available ADFs shall be tuned to the navigation facilities prescribed in the actual procedure.

- Only One Station Available in the Terminal Area
  When approaching the station in the terminal area, tune both ADF receivers to the station.

- Two or more Stations Available in the Terminal Area
  When commencing an approach, tune RED (ADF 1/LEFT) to the station situated nearest the touchdown point and stay there until touchdown.
  Tune GREEN (ADF 2/RIGHT) to the other station suitable for the approach.

- Preselect Position
  The preselect positions on the ADF control panel shall be preset for go-around in accordance with a missed approach procedure in approach charts.

  Note: Carefully monitor the approaches based exclusively on ADF indications and continuously check the correct tuning and identification of the stations concerned. Any discrepancy from expected indications shall be treated as a malfunction and the approach abandoned until the discrepancy has been clarified.

  Under certain abnormal wave propagation conditions, the carrier wave of NDB with limited range might be disturbed even if tuning and identification are correct.

- Other Approach
  In all other approaches, where NDB stations are available, the ADFs should be tuned In accordance with OM-A stated above.

110. When do we use the Marker ? (OM-A 8.3.2.2)

Use of the Marker System

Whenever a marker system is part of a published procedure, the system shall be fully utilized and monitored by pilots as follows:

- set both marker audio volumes as required
- set marker sensitivity switches in low position if applicable.

When a marker indication is received, check position of aircraft and/or start timing if required.

111. How do you consider the significant weather "WIND SHEAR" ? (OM-A 8.3.8.5.1-2)

Wind Shear

Pre Flight

During flight preparation, consider the possibility of windshear if:

- extreme variations in wind velocity and direction in a relatively short time span
- evidence of a gust front such as blowing dust on the airport surface
- surface temperature in excess of 30 deg. C
- dew point spread of 4 deg. C or more
- virga (precipitation that falls from the bases of high altitude cumulus clouds but evaporates before reaching the ground) are present
- on airports, when equipped, low level windshear alert is active (LLWAS)
- the forecasts indicate thunderstorm or frontal activity in the departure or arrival area.
  Examine the takeoff area with aircraft radar to determine if thunderstorm cells are in the vicinity of the airport.

In Flight

Pilot reports are the best indicator of windshear.

PIREPS to ATC should include:

- location of shear encountered

- altitude of shear encountered
- airspeed changes experienced (in knot, gain or loss)

112. State the use of the Autopilot ? (OM-A 8.3.18.2)

Use of Autopilot
General
The autopilot shall be used as an effective means to increase flying efficiency during all phases of flight where possible.

Keep to the instructions and limitations for the use of autopilot in the respective FCOM.

During the flight with autopilot engaged, PF shall monitor its function and shall immediately disengage if observing any discrepancies or uncomfortable operation.

In order to maintain positive control of aircraft at all times as well as to prevent passengers and crew from possible injury caused by adverse abnormal aircraft behavior during transition from auto to manual flight control operations, it is recommended that PF always keeps at least one hand on the control column during engaging or disengaging the autopilots.

Automatic Approach
In this type of approach the autopilot is utilized to capture and hold/track the relevant ILS localizer and glide path, provided the ground and airborne installations are functioning properly and the aircraft intercepts the ILS LOC beam at a distance of approximately 8 Nm (depending on intercept angle).

This form of approach ensures the best possibility of pilot monitoring with the least workload.

All approaches to runways with front beam ILS installations shall be planned as automatic approaches, unless such a procedure is considered unreliable, time consuming, or will cause passenger discomfort. If visual guidance is obtained at or above DA/DH, it is recommended to keep the autopilot engaged until reaching the minimum height permitted for autopilot operation in accordance with the respective FCOM provided it functions satisfactorily and a correct flight path is followed.

Semi-automatic Approach
In this type of approach, the autopilot is utilized to maintain the correct heading and/or rate of descent during an approach.

Localizer capture and hold/track on aircraft so equipped can also be utilized when approaches are made on VOR or ILS without glide path.

Depending on the relevant instructions in the respective FCOM, the approach can be flown with manual inputs to the autopilot regarding heading and rate of descent.

113. How the Flight Director system could be used ?

(OM-A 8.3.18.4)

Use of Flight Director System

General

Whenever a flight director system is installed and functioning, it shall be on and utilized during all phases of flight where it will assist the pilots in monitoring, maintaining or establishing a correct heading and attitude.

Approaches

The flight director system shall be used during all manual front beam ILS approaches to obtain the best localizer and glide path adherence, and shall be used as a monitoring device for automatic approaches.

It shall be on and utilized for all other approaches where it will assist the pilots in accordance with OM-A 8.3.18.1—Management of Automatic Flight Systems.

Monitoring

Whenever the flight director system information is used as a primary reference by PF, PM shall monitor the flying from the basic data as derived from NAV system not being used by PF for the flight director indications.

114. When Thrust levers shall be guarded ?

(OM-A 8.3.18.3)

Use of Auto-throttle

Autothrottle shall be used in accordance with the recommended procedures in the respective FCOM.

It is an effective means to reduce pilot workload and facilitate precise speed control.

Keep to the limitations of the autothrottle system. PF shall monitor its function and shall immediately disengage if observing any discrepancies or uncomfortable operation.

The throttles shall always be guarded below 1,500 ft to permit the pilot to promptly counteract the ineffective or erratic throttle control. This is especially important in wind shear and turbulence conditions to prevent the programming of excessive thrust reductions.

115. Who should make the required FMS entries and mode selection below 10,000 feet ?

(OM-A 8.3.18.1.5)

Management of Automatic Flight Systems

Crew Coordination

- The lowest level of automation used at any time determines allocation of crew duties with regard to AFS.
- During engagement/disengagement of autopilot or switching of autopilot, PF shall always have one hand on the control column. During takeoff and departure PF shall have this hand(s) on the controls.

- Thrust levers shall be guarded below 1,500 ft AGL. During approach PF shall have this hands on the controls and thrust levers below 1,500 ft AGL, except for necessary inputs to AFS.
- Programming of AFS on ground is normally the duty of PF.
- At the Guided manual level, PM will make the required AFS entries and mode selections upon order from PF.
- At the Directed automatic level, PF will make the required AFS entries and mode selections.
- At the Managed automatic level, PF manages the aircraft flight path through the FMS and normally makes the required FMS entries and mode selections. FMS entries below 10,000 ft other than short commands (e.g. "direct to" entries or speed interventions) should be accomplished by PM upon order from PF. PF navigational display should be used in a mode which shows the active route and at least the first active way point.

Level of Automation	AP	FD	PF	PM
Basic Manual	OFF	OFF or not followed	Handles the flight controls	Monitors flight progress
Guided Manual	OFF	ON	Handles the flight controls	Monitors flight progress Sets up AFS on PF order
Directed Automatic	ON	ON	Makes MCP/FGP selections Monitors flight progress	Monitors flight progress. Calls out impending flight envelop deviations
Managed Automatic	ON	ON	Makes input to FMS Monitors flight progress	Monitors flight progress

116. Stated the operational requirements for CAT II/III ? (OM-A 8.4.8.2)

Company Regulations for CAT II/III Operations

Operations

- LP shall perform the approach and landing, even RI or LIFUS.
- The P-i-C shall satisfy himself, prior to commencing CAT II/III approach, that:
  - the status of the visual and non-visual facilities is sufficient
  - low visibility procedures are in force
  - the flight crew members are properly qualified.
- For Type and Command Experience, see APPENDIX AWO 5.5: Type and Command Experience.
- Max available flap setting shall be used.
- The flight path must stay within the limitations stated in the respective FCOM regarding localizer and glide path.
- Crosswind component measured on ground shall not exceed 10 kt.

117. Does CAT II weather minima provide sufficient visual reference for making a manual landing ? (OM-A 8.4.8.3) (OM-A 16.2)

Use of Automatic Flight System

- Autoland is approved for all ILS runways, except where localizer is offset and when otherwise stated on the approach chart.

- Type of approach to be performed:
  - CAT II Automatic approach, when RVR not less than 350 m, and with automatic landing when RVR less than 350 m down to 300 m;
  - CAT III A Automatic approach with automatic landing;
  - CAT III B Automatic approach with automatic landing and automatic rollout.
- Whenever an autoland is performed, the autoland report form (OU-FM 8) shall be submitted and the autoland record form shall be filled in.

OPERATIONS CONCEPTS

CAT II Objective

The main objective of CAT II operations is to provide a level of safety equivalent to other operations, but in more adverse weather conditions and lower visibility.

CAT II weather minima has been established to provide sufficient visual references at DH to permit a manual landing (or a missed approach) to be executed (it does not mean that the landing must be made manual).

118. State the visual reference for CAT III without DH ?

(OM-A 8.4.7.5)

Visual References

- CAT III without DH
  For this category of operation, the decision to continue does not depend on visual references, even though a minimum RVR is specified.

  It is nevertheless good airmanship to confirm aircraft position with available visual references.

  However, the decision depends only on the operational status of the aircraft and ground equipment.

  If a failure occurs prior to reaching the AH, a go-around will be made. A go-around must nevertheless be performed if the autoland warning is triggered below AH.

  For Category III operations with no decision height there is no requirement for visual contact with the runway prior to touchdown.

119. What are the possible responses to the failure of any system, instrument or element during the CAT II/CAT III approach ?

(OM-A 8.4.7.6, OM-A 16.2)

Failures and Associated Actions

Follow the procedures as stated in the respective FCOM/FCTM.
Refer to Route Manual, RAR 8.9.2—INOP Tables/Failed or Downgraded Ground Equipment (EU-OPS).

Failures and Associated Actions During Approach

General

There are three possible responses to the failure of any system, instrument or element during the approach:

- CONTINUE the approach to the planned minima;
- REVERT to higher minima and proceed to a new DH/DA;
- GO AROUND and reassess the capability.

The nature of the failure and the point of its occurrence will determine which response is appropriate. As a general rule, if a failure occurs above 1,000 ft AGL the approach may be continued reverting to a higher DH/DA, providing the appropriate conditions are met (refer to "downgrading condition" hereafter).

Below 1,000 ft (and down to DH/AH when in CAT III) the occurrence of any failure implies a go-around and a reassessment of the system capability but for CAT II may continue to CAT I minima. Another approach may then be undertaken to the appropriate minima for the given aircraft status.

It has been considered that below 1,000 ft, not enough time is available for the crew to perform the necessary switching, to check system configuration and limitations and brief for minima.

In CAT III, a single failure (for example one AP failure or one engine failure) below AH does not necessitate a go-around. But a go-around is required if the autoland warning is triggered.

120. Stated the general of company regulations for CAT II /III operations ?

(OM-A 8.4.8)

Company Regulations for CAT II/III Operations

General

- CAT II procedure is mandatory when RVR is below 550 m.
- CAT III procedure is mandatory when RVR is below 350 m (300 m where stated by local authorities.)
- RWYs approved for CAT II/III are indicated in the appropriate approach charts. DH is based on Radio Altimeter (RA) reading.
- CAT II/III procedures shall be practiced during normal service, regardless of the weather conditions, when the necessary ground facilities are available and traffic conditions permit. This practice ensures flight crew familiarity with the procedures, builds confidence with the equipment and ensures appropriate maintenance of the Category II and III related systems.

Operations

- LP shall perform the approach and landing, even RI or LIFUS.
- The P-i-C shall satisfy himself, prior to commencing CAT II/III approach, that:
  - the status of the visual and non-visual facilities is sufficient
  - low visibility procedures are in force
  - the flight crew members are properly qualified.
- For Type and Command Experience, see APPENDIX AWO 5.5: Type and Command Experience.
- Max available flap setting shall be used.
- The flight path must stay within the limitations stated in the respective FCOM regarding localizer and glide path.
- Crosswind component measured on ground shall not exceed 10 kt.

121. State the use of automatic flight system for CAT II/CAT III approach ?

(OM-A 8.4.8.3)

Company Regulations for CAT II/III Operations

Use of Automatic Flight System

- Autoland is approved for all ILS runways, except where localizer is offset and when otherwise stated on the approach chart.
- Type of approach to be performed:

  CAT II Automatic approach, when RVR not less than 350 m, and with automatic landing when RVR less than 350 m down to 300 m;

  CAT III A Automatic approach with automatic landing;

  CAT III B Automatic approach with automatic landing and automatic rollout.
- Whenever an autoland is performed, the autoland report form (OU-FM 8) shall be submitted and the autoland record form shall be filled in.

122. What are the En-Route Alternates planning minima for EDTO/ETOPS ?

(OM-A 8.5.6.8)

EDTO En Route Alternate Weather Requirement for Planning

An aerodrome may be nominated as an EDTO en route alternate for flight planning and release purposes if the available forecast weather conditions for a period commencing at one hour before the earliest potential time of landing and ending one hour after the latest nominated time of use of that aerodrome, equal or exceed the criteria required by the table below.

EDTO En Route Alternate for Planning

Approach facility	Ceiling	Visibility
Precision approach	Authorized DH/DA + 200 ft	Authorized visibility + 800 m
Non-precision approach or circling approach	Authorized MDH/MDA + 400 ft	Authorized visibility + 1,500 m

The above criteria for precision approaches are only to be applied to CAT I approaches.

The forecast wind, including any gusts, should be within the aircraft maximum crosswind limitations taking into account the runway condition (dry, wet or contaminated).

Where a condition is forecasted as PROB provided the percent factor of <40% (e.g. PROB 30), then that condition can be ignored. TEMPO, INTER and PROB 40 conditions must be fully considered in determining the suitability of an aerodrome.

123. What is the Entry Piont (EEP) and the Equitime Point (ETP) for EDTO/ETOPS ?

(OM-A 8.5.3)

Definitions

EDTO/ETOPS Entry Point (EEP)	The first point along the aeroplane's outbound route beyond which the aeroplane is no longer continuously within the threshold time, at the approved cruise speed (OEI or AEO), in still air and ISA conditions, from an adequate aerodrome.

Equal Time Point (ETP)	A point on the aircraft route which is located at the same flying time from two suitable diversion airports. The ETP position can be determined using a computerized flight planning, or graphically on a navigation or plotting chart.

124. What are the possible failure scenarios for calculating EDTO/ETOPS critical fuel scenarios ?

(OM-A 8.5.6.9)

EDTO Flight Preparation and Planning

Critical Fuel Scenario

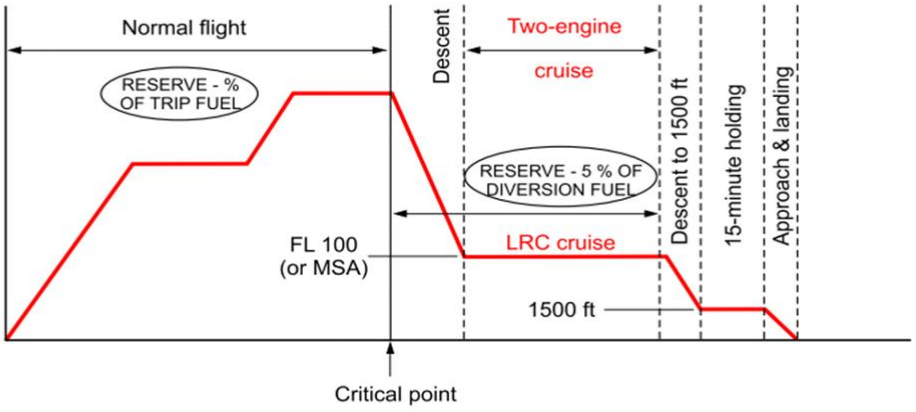
Considering the following possible failure scenarios occurring at the Critical Point (CP):

- engine failure only
- engine failure +pressurization failure
- pressurization failure only.

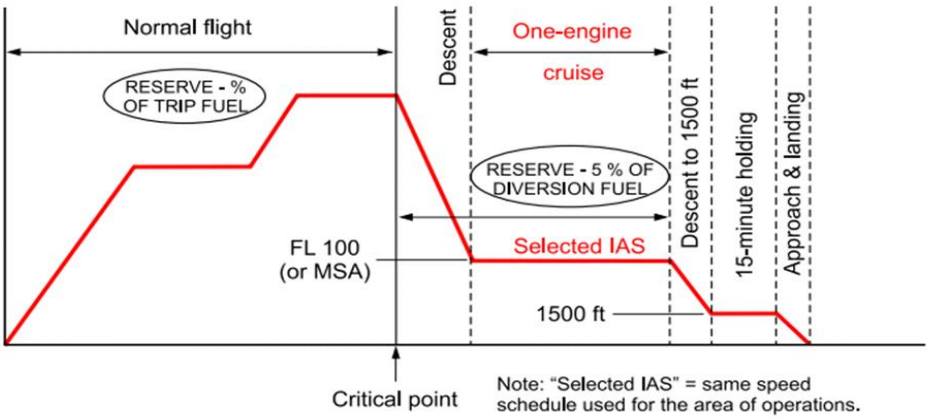
The EDTO critical fuel scenario is the scenario requiring the highest EDTO fuel reserves. But the engine failure only case will never be a critical fuel scenario because of the diversion being conducted at higher flight levels.

Depending on the selected one-engine-out diversion speed, either one of the 2 scenarios below may be the critical fuel scenario.

Fuel for depressurization all engines running



Fuel for depressurization one engine out



125. State the diversion fuel for EDTO/ETOPS critical fuel reserves ?

(OM-A 8.5.6.10)

EDTO Fuel Reserves

The aircraft shall not be dispatched for an EDTO flight unless it carries sufficient fuel to meet the normal fuel requirements plus such additional fuel (EDTO built up fuel) as may be required to fly to a suitable airport in the event of an engine shutdown and/or loss of the pressurization.

It should be assumed that this event occurs at the most critical point in terms of overall fuel requirements along the planned routing.

EDTO Fuel Reserves

EDTO diversion fuel		
1	Upon reaching the Critical Point, Fuel required to fly to an EDTO alternate which is the greatest of:	• Flight at planned cruise altitude and speed assuming a rapid decompression at the most critical point followed by descent to 10,000 ft or MTCA/MGA if higher. • Flight at the approved one-engine-inoperative cruise speed assuming a rapid decompression and a simultaneous engine failure at the most critical point followed by descent to 10,000 ft or MTCA/MGA if higher. • Flight at the approved one-engine-inoperative cruise speed assuming an engine failure at the most critical point followed by descent to the one-engine-inoperative cruise altitude.
2	Upon reaching the EDTO alternate:	Hold at 1,500 ft AGL for 15 min
3	When commencing approach:	Fuel for an instrument approach and landing
4	● If using a wind model acceptable to CAAT Note: CAAT accept wind aloft forecasted from the World Area Forecast System (WAFS).	Add 5% wind speed factor (i.e., an increment to headwind or a decrement to tailwind) on the actual forecast wind used to calculate fuel in the greatest of (a), (b) or (c) above to account for any potential errors in wind forecasting.
	● If using a wind model not acceptable to CAAT	Add 5 % CF to the greatest of a), b) or c) above
5	MEL items (if any):	Add fuel penalties
6	If APU is required:	Add APU fuel consumption
7	If icing is forecasted:	Fuel for engine anti-ice and wing anti-ice including the effect of ice accretion on unheated surfaces.

126. What should be done in the event of weather deterioration at an EDTO/ETOPS alternate below applicable landing minima ?

(OM-A 8.5.7.1)

En Route Monitoring

The EDTO en route alternate weather requirement for planning do not apply once in flight.

During flight, the flight crew should remain informed of any significant changes in conditions at designated EDTO en route alternate aerodromes. The information could either be TAF or METAR, SIGMET or a combination considered as appropriate with the significant changes.

Prior to proceeding beyond the EEP, the aeroplane status, fuel remaining, the forecast weather for the period of suitability and where possible field conditions and facilities at designated EDTO en route alternates should be evaluated.

If any conditions are identified which could preclude safe approach and landing on a designated en route alternate aerodrome (such as weather forecast below landing minima) then the flight crew should take appropriate action such as re-routing to remain within THAI's maximum approved diversion time from an en route alternate aerodrome with forecast weather to be at or above landing minima.

This does not override the pilot in command’s authority to select the safest course of action.

127. State EDTO/ETOPS system failures that have to justify the diversion ?

(OM-A 8.5.7.4)

Re-routing or Diversion Decision Making

Upon occurrence of an in-flight shutdown of an engine, the flight crew should promptly initiate diversion to the nearest aerodrome, in terms of time, determined to be suitable by the flight crew.

In the event of a single or multiple primary system failure, the pilot will initiate the diversion procedure to fly to and land at the nearest aerodrome in terms of time, determined to be suitable by the flight crew, unless it has been justified that no substantial degradation of safety results from continuation of the planned flight.

The following failures justify the diversion:

- electrical system failures which would result in electrical power being available from only one single primary source remains (only 2 AC power sources remains for 787)
- all smoke warnings except the source has been positively identified as harmless
- hydraulic system failure which seriously restricts the aircraft operations
- explosive decompression or other structural damage.

When deciding a diversion whilst conducting an EDTO flight shall be considered the following:

- aircraft configuration, weight and systems status
- wind and weather conditions en route at diversion altitude
- minimum altitudes en route to the diversion aerodrome
- fuel required for the diversion
- aerodrome condition, terrain, weather and wind
- approach aids and lighting
- RFFS capability at least category 4 at the diversion aerodrome

- facilities for aircraft occupants—disembarkation & shelter
- medical facilities
- pilot's familiarity with the aerodrome.

128. What is the purpose of MEL ?

(OM-A 8.6.1)

Minimum Equipment List (MEL)

A Minimum Equipment List (MEL) is established for each aircraft type specifying the equipment, systems and components which must be operative in order that the aircraft may be considered airworthy for dispatch.

The purpose of MEL is to provide a dispatch aid for flight crew and maintenance crew in their efforts to bring an aircraft from its point of origin to its point of destination safely and on time when repair of a deficiency is not possible without considerable impact on the flight schedule.

The MEL specifies the dispatch conditions: the conditions to be fulfilled and the procedures to be performed, in order to permit the revenue flights to be flown with the inoperative item for a limited period of time.

Furthermore, the MEL must take into account the area of operation including whether the aircraft is being dispatched from base or an outstation.

The MEL specifies the equipment, components and systems which may be totally or partially inoperative, while airworthiness, flight safety and passenger comfort is still maintained. It also specifies ultimate time limits for rectification of inoperative equipment or systems.

It is not the intention that specified time limits in the MEL should be utilized to the extreme.

All efforts shall be made to rectify inoperative items as soon as possible in order to minimize the time during which an aircraft is operated with reduced system redundancy.

The MEL should be used as a means to bring an aircraft to a station where repair can be made without interrupting or delaying an ongoing flight.

129. What is CDL ?

(OM-A 8.6.2)

Configuration Deviation List (CDL)

Similarly to the above, the Configuration Deviation List (CDL) lists the aircraft secondary airframes that may be missing for a particular operation and pictorially indicates areas of damage to the aircraft skin/ structure that is considered acceptable for flight. Any part not included in the list must be considered as necessary. It is important to repair the aircraft at the first airport where repairs or replacements may reasonably be made, since additional malfunctions may require the aircraft to be taken out of service.

No more than one part or one combination of parts of one system may be missing, except otherwise specified. Parts of different systems may be simultaneously missing, unless otherwise specified in this list. Missing part may introduce performance penalties that are cumulative.

130. State the authority of the P-I-C about dispatched aircraft due regard to MEL/CDL ?

(OM-A 8.6.3)

Application of MEL/CDL

The Minimum Equipment List (MEL) is a document established by THAI and approved by CAAT.

THAI's MEL is developed on the base of Master MEL (MMEL)/DDG and customized by THAI as a function of its own operational policies and CAAT requirements. The MEL shall never be less restrictive than the MMEL.

Note: The MEL may be more conservative than the authority requirements but must never be less restrictive.

The Configuration Deviation List (CDL) is a document approved by the Airworthiness Authority having certified the aircraft. The CDL is included in the Airplane Flight Manual (AFM).

The P-i-C shall not commence a flight unless he is satisfied that:

- the aircraft is not operated contrary to the provisions of the Configuration Deviation List (CDL)
- the instruments and equipment are in operable condition except as provided in the MEL.

The P-i-C shall decide whether or not to accept an aircraft with unservice abilities allowed by the CDL or MEL.

In the MEL, any item is deemed "inoperative", when it does not satisfactorily fulfill its intended function, regardless of the reason.

An item is deemed to be inoperative when:

- it does not work at all or
- it does not ensure all functions for which it was designed or
- it does not consistently work within its designed operating limits or tolerances or
- it is requested to be considered inoperative by the dispatch conditions or
- it is not available due to a primary failure.

Whilst operating within the limits of the MEL/CDL, the aircraft is deemed to be airworthy and capable of operating within the specified environment.

131. Which flights are considered as the non-revenue flights ?

(OM-A 8.7.1)

Definitions of Non-revenue Flights

The following flights are considered as non-revenue flights:

- training flights
- functional check (“Test”) flights
- delivery flights
- ferry flights
- demonstration flights
- positioning flights with or without passengers
- other special flights.

132. Who are accepted as passengers on non-revenue flights ?

(OM-A 8.7.9)

Passengers on Ferry, Test and Training Flights

On non-revenue flight, only Company's employees, their dependants or invited guests may be carried as passengers.

On test and training flights, only Company's employees and CAAT representatives may be accepted as passengers.

Passengers must not be accepted:

- on test flights concerning the airworthiness of the aircraft
- on flights including any abnormal maneuver such as stalls, etc.
- on one engine out Ferry flight
- when the handling of the passengers will interfere with the handling of Company's revenue
- flights or delay the test or training flight.

Carriage of passengers on Non-Revenue flights will always be subject to the PiC's approval.

The following procedures must be adhered to:

- the passenger shall be issued a ticket
- the passenger must sign a waiver form to be filed at the station
- in the case of passengers under 18 years of age, written permission from the parents must be presented and filed at the station
- the passenger should be briefed on conduct in the aircraft in order not to interfere with the test or training
- the P-i-C should ensure that the passenger is holding a ticket.

The P-i-C shall assign a crew member(s) to be responsible for cabin safety checks. Subject to P-i-C's discretion, the demonstration of safety belts, Oxygen masks, life vests and emergency evacuation may be avoided, if all persons on board are familiar with it's usage. A person(s) shall always be selected and advised to lead all actions in case of an emergency, and also to ensure that signals or orders given from the flight deck are adhered to by all persons carried. He shall also be informed that he must keep the P-i-C briefed on any disturbances or unexpected occurrences in the cabin.

Note: In the instruction, the term "passengers" does not include inspectors of the authorities or technicians, who may be assigned to the flights, even though such personnel are issued tickets.

133. What is the positioning flight ?

(OM-A 8.7.7)

Positioning Flights

A positioning flight is a flight to position an aircraft to an aerodrome for commercial operations.

Positioning flights must be performed with at least the minimum flight crew and must follow the standard procedures described on the Operations Manual.

Only crew members of the Company may be transported on the way to or from flight duty (dead head crews). In this case, the P-i-C nominates one crew member to be responsible for cabin safety checks.

In accordance with the P-i-C, the demonstration of safety belts, oxygen masks, life vests and emergency evacuation may be avoided, if all person on board are familiar with the demonstration of their use.

134. State the conditions for crew members which oxygen must be provided and used ?

(OM-A 8.8.1.1)

Condition Under which Oxygen must be Provided and Used for Crew Members

Each flight crew member on duty and for all other crew members use supplemental oxygen continuously whenever the cabin altitude exceeds 10,000 ft.

Recommendations for pilots on duty

At cabin pressure altitudes of 10,000 ft and below, the following recommendations apply to pilots on duty:

- when flying between 8,000 and 10,000 ft cabin altitude for more than four consecutive hours the pilots on duty should take oxygen at suitable intervals
- the use of oxygen at other lower altitudes is also recommended by the medical authorities. It is, therefore, left to the pilot's discretion to use it accordingly if he so desires
- whenever exhaust fumes from ground power units or other airplane are noticed to have entered the flight deck, it is recommended to use oxygen until contamination is terminated.

135. State the conditions which oxygen must be provided and used for passengers ?

(OM-A 8.8.1.2)

Condition Under which Oxygen must be Provided and Used for Passengers

During flights with high cabin altitude, oxygen must be available for passengers as follows:

- for flights at cabin pressure altitudes above 15,000 ft, oxygen shall be provided for each occupant carried for the duration of flight at such altitude
- for flights at cabin pressure altitudes above 14,000 ft to and including 15,000 ft, oxygen shall be provided for the duration of flight at such altitude for 30 percent of the number of passengers carried
- for flights at cabin pressure altitudes above 10,000 ft to and including 14,000 ft, oxygen supply shall be sufficient for 10 percent of the number of passengers carried for the duration of flight in excess of 30 min.

When any of the above conditions exist or are expected, the P-i-C shall inform the cabin crew accordingly. They shall pay special attention to passengers showing sign of discomfort and give such passengers first aid oxygen as required.

Oxygen Requirement for Crew and Passengers

First Aid Oxygen

For the flight at and above 25,000 ft altitude, portable oxygen bottles are provided for cabin crew and passengers who physiological reasons might require undiluted oxygen for first aid treatment following descent due to rapid decompression.

Two types of portable oxygen bottles; 120-liter and 310-liter bottles are available on board. Each bottle is provided with one oxygen mask and has 2 and 4 liter per minute outlets. If selecting 4 liter

per minute outlet, 120-litter bottle can be used up to 30 minutes and 310-liter bottle can be used up to 75 minutes.

The number of portable oxygen bottles installed in the cabin is normally more than that required by the regulation. The number in excess, spare bottles can be used for medical purpose.

First aid oxygen is intended for those passengers who, having been provided with the supplemental oxygen during emergency descent initiated due to a still need to breathe undiluted oxygen when the amount of supplemental oxygen has been exhausted.

This quantity of oxygen, required as first aid oxygen, is independent to and must be added to the required "supplemental oxygen" quantity for the case of emergency descent.

The amount of first-aid oxygen should be calculated for the part of the flight after cabin depressurization, during which the cabin altitude is between 8,000 ft and 15,000 ft, when supplemental oxygen may no longer be available.

The conditions above should reduce the period of time during which the first-aid oxygen may be required and consequently should limit the amount of first-aid oxygen to be carried on board.

136. State the use of flight crew oxygen.

(OM-A 8.8.2.3)

Use of Flight Crew Oxygen
General

In order to be able to don their masks as quickly as possible, flight crew members shall, therefore, practice the donning operation regularly, e.g., in connection with each preflight test of the oxygen mask.

Non-pressurized Flights

Both pilots shall use oxygen continuously when flying:

- at flight altitude above 10,000 ft through 12,000 ft MSL for that part of the flight of more than 30 minutes duration
- Above 12,000 ft MSL.

Pressurized Flights

Before flight, each pilot shall perform preflight check of his oxygen equipment to ensure that the oxygen mask is functioning, fitted properly, connected to appropriate supply terminals, and kept in "Ready position", and that the oxygen supply and pressure are adequate for use.

During flight, each pilot at controls shall have his oxygen mask in "Ready position" which can be donned for immediate use.

When operating above FL 410, if one pilot leaves the controls, the remaining pilot at the controls shall put on and use an oxygen mask until the other pilot returns to his station.

Note : 1. "Ready position" means that the masks are kept in their storage and can be pulled out and placed on the face with one hand within 5 sec, supplying oxygen and properly secured and sealed.

2. Pilots shall be familiarized and capable of donning the mask with one hand within 5 sec. The headset must be removed before the mask is put on.

The mask should be donned without disturbing eyeglasses or inhibiting radio communications.

In Emergencies

All flight crew members shall immediately wear their masks in the "donned emergency position", either by donning the mask or, if already in the "donned normal position", by changing over to the "donned emergency position", whenever:

- a cabin decompression occurs
- when above FL250, any warning comes on which cannot be immediately and indisputably identified as having no relation to the loss of cabin pressure.

Caution: **Time of useful consciousness in case of a rapid decompression at 40,000 ft is less than 15 sec, if oxygen is not immediately provided.**

An easily accessible quick donning type of breathing equipment for immediate use is required for each flight deck crewmember.

Portable protective breathing equipment is required at each cabin crew station, in galleys and cargo compartments.

This equipment must protect the eyes, nose and mouth of each crew-member while on duty and provide oxygen for a period of not less than 15 minutes.

The oxygen required for breathing protection can be included in the supplemental oxygen.

An additional, easily accessible portable PBE must be provided and located at or adjacent to the hand fire extinguishers, where the fire extinguisher is located inside a cargo compartment, the PBE must be stowed outside but adjacent to the entrance to that compartment.

137. What does the "CABIN CLEAR" report has been received from the IM/Air Purser, indicating ?

(OM-A 8.9.1.3)

Cabin Clear

Before pushback or engine start, the P-i-C shall ensure that the "Cabin Clear" report has been received from the CIC or designated pilot when flight operation without cabin crew as describe in OM-A 4.1.3.1, indicating that:

- security pre-flight check has been performed
- cabin galleys, passengers and cabin crew are ready for aircraft movement
- crew meals are loaded
- cabin crew's passports/visa and vaccination certificates (if applicable) are checked
- all cabin doors are closed and armed
- the document and equipment according to Safety/Security Quick Reference for Cabin Crew is checked
- seating is in accordance with the load-sheet
- headcount was performed as required.

Note:

- P-i-C shall designate a flight crew and assistant to operate the cabin door for flight operation without cabin crew member, and door 1L is preferable. The doorman should operate the door by the two-man crew concept.
- Where applicable, the "Cabin Clear" report shall be done by interphone voice or verbal to P-i-C.

138. During taxiing, can we always follow the taxi guidelines markings to ensure adequate clearance ?

(OM-A 8.9.1.9)

Taxi Guidelines and Ramp Signals

- Taxi guidelines vary from place to place and do not always ensure adequate hindrance free clearance. They shall be used with CAUTION as guidance to aircraft positioning.
- The signals given by the ramp controllers are an aid when taxiing on the tarmac and parking area.
- The P-i-C remains responsible for the safe maneuvering of the aircraft.

139. How to prevent runway incursion during taxi.

(OM-A 8.9.1.11)

Runway Incursion Prevention

- Maintain high level of situation awareness while operating in the airport environment.
- Never cross a red stop bar.
- Follow specific reduced visibility and relevant LVO policies and procedures.
- When in doubt, ask.
- Know the aircraft position using all available resources, such as on-board moving map and cameras, if installed, heading indicator, airport diagrams, airport signs, markings, lighting and air traffic control
- Briefing of the expected taxi routing are to be included in the takeoff and approach briefings.
- Do not stop on the runway unless it is necessary to do so.
- Visually clear the final approach path prior to taxiing into the takeoff position on the runway.
- Verify the final approach path prior to taxiing into the takeoff position on the runway on TCAS or moving map with TCAS information, or on ND/rose map as applicable.
- Before entering the departure runway, both pilots shall verify that the runway and runway entry point are correct and agree with the sign. The runway and runway entry point shall be called out when the sign is visually confirmed, e.g. “Bravo One Three, Runway Zero One Right”.
- Strictly adhere to Sterile Flight Deck procedure, do not make PA announcements during taxi unless for safety reasons.
- Use of Standard R/T phraseology and monitoring clearances given to other aircraft.
- Obtain directions or progressive taxi instructions when taxi route is in doubt.
- Crosscheck and verify takeoff and landing runway clearance.
- Questioning clearances when holding or lined up in position for takeoff on the runway and takeoff clearance has not been received within the reasonable time.
- Use of aircraft lighting during taxi, runway crossing, takeoff and landing to make the aircraft more conspicuous.
- Adhere to the use of transponder setting local procedure for each airport.

140. What is affected when applying reduced V1 ?

(OM-A 8.9.2.4)

Selection of Takeoff Configuration, Thrust & Speeds

Selection of V1

- Reduced V1 shall be used on wet and contaminated runways according to rules in the respective FCOM.
- For aircraft types where a range of permissible V1 is available, additional accelerate stop margin can be obtained by selecting a low V1 within the permissible rang.

Note: This will reduce screen height in case of continued takeoff after engine failure, but will not compromise the required screen height (35 or 15 ft).

- The option of selecting a V1 is available in the pre-takeoff planning stage only.
- Once a V1 has been selected, this V1 is valid for the STOP/GO decision.
- Alignment.
- Alignment distance with respect to 180°/90° or full length alignment and the length of the aircraft are considered in permissible takeoff weights.
- For runway-limited takeoffs, use minimum possible alignment distance.
- If taxi speed can be maintained until advancing throttles for takeoff, the kinetic energy may compensate for longer alignment decision.

141. May an IFR flight be cleared to execute a visual approach ?

(OM-A 8.9.7.6)

Visual Approach

When performing a visual approach, the airport and/or the landing runway must be in sight at all times. Visual approaches clearance must be issued by ATC. Visual approaches are NOT a VFR procedure.

Day Time

Visual approaches may be executed during daytime when weather conditions so permit.

Night Time

Visual Approach during Night Time

Requirements:	
Terrain clearance:	• The position of the aircraft is within MSA determined by navigation aids. • The position during the whole descent and approach shall be constantly confirmed by means of navigation aids available.
Ground based Equipment:	The ground equipment and lighting requirements shall be fulfilled. See OM-A 8.1.3.3.7—Requirement for Night Landing.

An IFR flight may be cleared to execute a visual approach provided that visual references to the terrain are maintained, and:

- the reported ceiling is at or above the approved initial approach level for the aircraft so cleared
- separation is provided between an aircraft cleared to execute a visual approach and other arriving and departing aircraft

- for successive visual approaches, separation shall be maintained by ATC until the pilot of a succeeding aircraft reports having the preceding aircraft in sight
- the aircraft shall then be instructed to follow and maintain own separation from the preceding aircraft.

142. What is the minimum runway width for takeoff and landing ?

(OM-A 8.9.2.3)

Runway Width Limitations

- Other aircraft types: 45 m or wider.
- Further performance limitations (crosswind / runway contamination) may require wider runways.
- Operation from narrower runways can be approved by DP.
- Such approval will be indicated in the Airport Chart or Company information contained in the Airport Manual.

143. What are the requirements for an intersection takeoff ?

(OM-A 8.9.2.3)

Intersection Takeoff

- Normal takeoffs are to start from the beginning of a runway.
- Intersection takeoffs are permitted if:
  - the Gross Weight Chart (marked by a letter on the Airport Chart) states that the takeoff runway may start from such a point in order to:
    - comply with noise abatement procedure
    - comply with the requests from ATC
    - save fuel
    - reduce delays or adhere to schedule.
- Intersection takeoff requirements:
  - visibility of 2 km or more (exception: when intersection takeoff is an official requirement).

144. Which RVR value determines the minima for takeoff during the low visibility operation ?

(OM-A 8.9.2.7)

Refer to Route Manual (RM)

Visibility refers to:

- meteorological visibility or
- RVR

Multiple RVR use:

- if more than 1 RVR value is given for the same runway, the lowest RVR determines the minima for takeoff
- additional values shall be used as guidance unless otherwise specified
- the reported RVR /visibility value representative of the initial part of the takeoff runway can be replaced by pilot assessment.

145. Who shall perform takeoff in RVR less than 500 meters ?

(OM-A 8.9.2.7)

Fog dispersal:

- fog dispersal by means of taxiing along the runway is not permitted
- takeoff in low visibility:
  - **all takeoffs in RVR of 500 m or less (visibility if RVR not available) must be performed by the LP.**
- low visibility takeoff crosswind:
  - maximum crosswind is 10 kt
- use of landing and/or strobe lights in limited visibility:
  - the use of such lights during takeoff in low visibility is not recommended
  - the use of external lights may cause disorientation and reduce forward visibility due to reflections and blinding effect.
  - false impressions of drift may also occur in precipitation and crosswind conditions.

146. With speed close to V1, is it justified to continue a takeoff if a pilot is incapacitated ?

(OM-A 8.9.2.8)

Engine Failure Basic Rules

Early stage of the takeoff where no doubt exists as to a safe stop on the runway:	STOP
At the speeds close to V1.	The nature of the abnormality effects on the airworthiness of the aircraft in a continued flight versus the possibility of making a safe stop decide over STOP or GO.
Failures that may justify a continued takeoff: "GO"	• Engine fire WARNING when all engines develop normal thrust indication failure of instruments not absolutely required. • General electrical failures • **Pilot's incapacitation (body not blocking controls)** • Tire failure close to V1 on a marginal runway with all engines developing desired power.
Failures that may justify a discontinued takeoff: "STOP".	• Collision with foreign objects resulting in structural damage. • Flight control failure or blocking of controls if aircraft acceleration is not considerably effected.

Note: A takeoff discontinued at the speed above V1 on a minimum length runway is unprotected from a performance point of view.

147. What type of abnormality justifies a discontinued takeoff after V1 ?

(OM-A 8.9.2.8)

Engine Failure Basic Rules

Early stage of the takeoff where no doubt exists as to a safe stop on the runway:	STOP
At the speeds close to V1.	The nature of the abnormality effects on the airworthiness of the aircraft in a continued flight versus the possibility of making a safe stop decide over STOP or GO.
Failures that may justify a continued takeoff: "GO".	• Engine fire WARNING when all engines develop normal thrust indication failure of instruments not absolutely required. • General electrical failures • Pilot's incapacitation (body not blocking controls) • Tire failure close to V1 on a marginal runway with all engines developing desired power.
Failures that may justify a discontinued takeoff: "STOP".	• **Collision with foreign objects resulting in structural damage.** • **Flight control failure or blocking of controls if aircraft acceleration is not considerably effected.**

Note: A takeoff discontinued at the speed above V1 on a minimum length runway is unprotected from a performance point of view.

148.What is the Mental Review ?

(OM-A 8.9.2.8)

Mental Review by the P-i-C

P-i-C, prior to starting a takeoff, mentally reviews these factors affecting that particular takeoff:

- gross weight
- available runway length (overrun)
- runway conditions
- obstacles (beyond the threshold and in the climb area)
- climb conditions (icing, wind conditions)
- procedure for engine failure after takeoff for the respective airport
- action in case of tire failure
- aircraft serviceability and technical remarks.

149.What is speed an aircraft can be expected to lift off at the end of the required runway length in case of a continued take-off after engine failure ?

(OM-A 8.9.2.8)

Engine Failure Basic Rules

Ref: respective FCOM

- If the engine failure occurs at or after V1, normally go.
- If the engine failure occurring before V1, normally stop.

An aircraft can be expected to lift off at the end of the required runway length in case of a continued takeoff after engine failure at speeds:

- 2-engine-aircraft: V1 – 10
- 4-engine aircraft: V1 – 20
- all aircraft on wet and slippery runway when reduced V1 is used: V1 – 5.

Note: The basic V1 concept is based on dry runway conditions and since there is no full explanation for contamination, it will not normally be possible to stop the aircraft on a runway-length-limited takeoff from speeds close to V1 when the runway is covered with water, slush, snow or ice even if reversing and prescribed corrections have been applied.

To be reviewed with TG Flight Ops; V1 speeds on contaminated RWY s should be available.
For each aircraft type, consult the respective GWC for reduced V1 operations.
The nature and time of an engine failure must be taken into consideration:

150. In case we have noticed or been reported of tires failure, does it always mean that the damage will not affect the continuation of a flight even if all indications are normal ?
(OM-A 8.9.2.8)

Engine Failure Basic Rules

Early stage of the takeoff where no doubt exists as to a safe stop on the runway:	STOP
At the speeds close to V1.	The nature of the abnormality effects on the airworthiness of the aircraft in a continued flight versus the possibility of making a safe stop decide over STOP or GO.
Failures that may justify a continued takeoff: "GO".	• Engine fire WARNING when all engines develop normal thrust indication failure of instruments not absolutely required. • General electrical failures • Pilot's incapacitation (body not blocking controls) • **Tire failure close to V1 on a marginal runway with all engines developing desired power.**
Failures that may justify a discontinued takeoff: "STOP".	• Collision with foreign objects resulting in structural damage. • Flight control failure or blocking of controls if aircraft acceleration is not considerably effected.

***Note**: A takeoff discontinued at the speed above V1 on a minimum length runway is unprotected from a performance point of view.*

Blown tyre or landing gear structural failures/recommendations:

- these may cause severe damage to landing gear doors, brake system, fuselage, wings and flaps as well as wiring and tubes in the landing gear well
- keep landing gear extended for at least 5 min (except when prohibited from a performance point of view)
- if possible, confirm by visual check from aircraft or control tower that no fire or visible damage exists

- be very restrictive with regards to the continuation of a flight as damage may not be immediately discovered but may deteriorate and make a continued flight hazardous
- ask for an inspection of the takeoff area to check that vital parts have not become detached, or are causing a hindrance on the runway.

151. During climb, when the aircraft altitude is within 1,000 ft of the assigned altitude, may the rate of climb be greater than 1,000 ft per minute ?
(OM-A 8.9.3.1)

Rate of Climb

- At least 500 ft/min within 1,000 ft of reported vacated altitude
- 1,000 ft/min or less within 1,000 ft of the new assigned altitude
- 1,500 ft/min or less within 2,000 ft of the new assigned altitude

Unless:

- ATC prescribes otherwise
- it may be greater than 1,000 ft/min in an automatic altitude control mode
- both Pilots must ensure that aircraft correctly levels off at the required altitude.

Caution: Excessive rate of climb may trigger an unintentional TCAS WARNING in RA mode if flight is conducted in a congested area.

Call out:

- PM calling out at 1,000 ft before reaching a cleared altitude/flight level
- if that call out cannot be made by PM, the call out shall be made by PF.

***Notes**: 1. On the aircraft equipped with an aural altitude alert, the callout by PM is not required, but "checked" shall be made by PF after the altitude alert.*
2. Altitude pre-select system, if equipped, shall always be used.

152. What is a Range Control ?
(OM-A 8.9.4)

Range Control
Range Control is the checking of actual fuel remaining for a certain distance versus the fuel estimated for that distance:

- the actual fuel remaining shall be checked versus the flight plan fuel remaining
- the difference, if any, shall be recorded
- reasons for any difference shall be established
- the range control shall be carried out at least every 60-90 min simultaneously with suitable position reports.

153. When shall an approach briefing be performed ?
(OM-A 8.9.5)

Preparation for Descent and Approach
Briefing
Briefing is a means of making agreement among the flight crew as to when, where, and how the approach and landing or a missed approach would be carried out. Briefing shall be done in a timely manner when every crew member can pay full attention. PF shall, in his briefing, clearly state his

intentions and ensure that PM is fully aware of the type of approach to be performed and the procedures to be followed in case of a go-around, utilization of Auto Flight Control System, setting of navigation aids, and checks required during approach.

The approach briefing should cover:

- aircraft technical status for equipment that may affect approach and landing
- NOTAMs
- actual weather conditions and the minimum conditions applicable for the type of approach to be made
- runway in use and type of approach
- navigation aids including markers used during approach
- applicable minimum altitude for each segment
- altitude checks over fix, OM or other equivalent positions
- DA/H or MDA
- Minimum Safe Altitude (MSA)
- terrain, manmade obstacles
- terrain features (location and elevation of hazardous terrain or man-made obstacles)
- clearance limits
- all relevant callouts especially during a CAT II/III approach and landing
- during briefing, the actual values, e.g. "430 ft" and "330 ft" shall be mention, whereas during approach, the callout shall be done in accordance with the respective FCOM
- a reminder of who is to stay on instruments and who is to look out for visual guidance after 100 ft prior to reaching minima
- missed approach procedures including setting of navigation aids. If a circling approach is planned, determine a missed approach procedure to be used at specific points along the circling pattern
- minimum fuel for diversion
- HIRA (e.g. adverse weather and wind conditions at destination, runways conditions, Minimum Runway Occupancy Time (MROT) procedure, aerodrome hot spots, risk of bird strike in vicinity of the aerodrome, congestion area at the aerodrome etc.)
- alternative type or runway for approach.

154. What is a precision and non-precision approach ?

(OM-A 8.9.5)

Precision approach: An approach where the pilot continuously receive both lateral and vertical guidance from the signal of an electronic landing system; e.g. ILS, PAR

Non-precision approach: An approach where the pilots receive only lateral guidance from the signal of an electronic approach aids; e.g. LOC, VOR, NDB, LPV

155. What is the difference between an automatic and semi-automatic approach ?

(OM-A 8.9.5)

Automatic approach: An approach utilizing aircraft autopilot to capture and to hold the ILS localizer and glide path.

Note: If visual guidance is obtained at or above DA/DH, it is recommended to keep the autopilot engaged until reaching the minimum height permitted for autopilot operation

according to the respective FCOM, provided it functions satisfactorily and a correct flight path is followed.

Semiautomatic approach: An approach utilizing aircraft autopilot to maintain the correct heading and/or rate of descent during an approach.

156. Can we execute a visual approach during the night time ? (OM-A 8.9.7.6)

Visual Approach

When performing a visual approach, the airport and/or the landing runway must be in sight at all times.

Visual approaches clearance must be issued by ATC. Visual approaches are NOT a VFR procedure.

Day Time

Visual approaches may be executed during daytime when weather conditions so permit.

Night Time

Visual Approach during Night Time

Requirements:	
Terrain clearance:	● The position of the aircraft is within MSA determined by navigation aids. ● The position during the whole descent and approach shall be constantly confirmed by means of navigation aids available.
Ground based Equipment:	The ground equipment and lighting requirements shall be fulfilled. See OM-A 8.1.3.3.7—Requirement for Night Landing.

An IFR flight may be cleared to execute a visual approach provided that visual references to the terrain are maintained, and:

- the reported ceiling is at or above the approved initial approach level for the aircraft so cleared
- separation is provided between an aircraft cleared to execute a visual approach and other arriving and departing aircraft
- for successive visual approaches, separation shall be maintained by ATC until the pilot of a succeeding aircraft reports having the preceding aircraft in sight
- the aircraft shall then be instructed to follow and maintain own separation from the preceding aircraft.

157. Can the rate of descent be more than 2,000 ft when aircraft altitude is within 2,000 ft of the indicated MOCA/MORA or MSA ?

(OM-A 8.9.6)

Descent

Before commencing a descent, consider various aspects as specified in the respective FCOM Altitude WARNING:

- during descent, if automatic call out is not available, PM shall call 1,000 ft prior to reaching a cleared altitude/flight level.

Rate of Descent

- At least 500 ft/min within 1,000 ft of reported vacated altitude.

- 1,000 ft/min maximum within 1,000 ft of the new assigned altitude unless ATC prescribes otherwise. Exceptions from this restriction may be made when utilizing an automatic altitude control system over uncongested area and the pilots shall pay special attention to flight instruments and to lookout for other aircraft that may generate TCAS alert.
- 2,000 ft/min maximum when the aircraft is at or below MSA + 2,000 ft. Exceptions may be made only during daylight with visible surrounding terrain or when a greater rate of descent is part of an approved ATC procedure according to RM. When a rate of descent of more than 2,000 ft/min is permitted below the mentioned altitudes, all pilots shall pay special attention to flight instruments and to lookout.
- To avoid TCAS RA in traffic congested area, the rate of descent shall be limited. See OM-A 8.3.6.2—TCAS/ACAS Procedures.

158. State the exceptions when an entire approach procedure is not required to be executed ?
(OM-A 8.9.7)

ATC Clearance
When an approach clearance has been received, the entire approach procedure must be executed except when:
- radar vectors to an approach within NAVAID coverage are given
- clearance for a visual approach is given
- clearance for a straight-in approach is given.

159. After passing the outer marker or equivalent position.
Can an approach be continued to the DA/DH/MDA if the official reported RVR or visibility falls below the required value ?
(OM-A 8.9.7.1)

Approach Ban
An approach may be continued to DA/DH/MDA if:
- at the outer marker or equivalent position, the officially reported RVR or visibility is not less than required
- converting the reported visibility in accordance with RM may derive RVR values
- if no outer marker or equivalent position exists, this position is substituted by 1,000 ft AGL
- after passing the outer marker or equivalent position, if the RVR/visibility falls below requirement, the approach may be continued to DA/DH/MDA
- for circling, both the official ceiling/vertical visibility and the visibility have to satisfy the circling minima
- keep the autopilot engaged until reaching the minimum height permitted for autopilot if visual guidance is obtained at or above DH/DA/MDA according the respective FCOM provided its function is satisfactory and a correct flight path is followed
- in the event where weather conditions are reported to drop below applicable Category III minima after an aircraft has passed the final approach point or final approach fix, as applicable
- operations based on an AH may continue to land regardless of reported weather conditions if equipped with a fail operational rollout system which did not indicate a malfunction prior to passing alert height, and the pilot considers continuation a safe course of action.

160. In IMC the aircraft shall not descend from the initial /intermediate approach altitude unless ?

(OM-A 8.9.7)

Terrain Clearance

The aircraft shall:

- cross the fix or facility
- fly outbound on the specific track
- descend as necessary to the procedure altitude/height.

No lower than the minimum crossing altitude/height associated with that segment.

If a further descent is specified after the inbound track, the aircraft is considered established when:

- within a half-full scale deflection for the ILS and VOR
- within ±5° of the required bearing for the NDB.

When performing a CANPA, the recommended descent rate and/or glide slope angle shall be used in order to reach MDA at the proper position from threshold, thus enabling a safe landing.

Do not perform a noise abatement procedure during the approach if they are in conflict with the stabilized approach procedures for the aircraft type in question.

161. State the required visual references for a non-precision or ILS CAT I approach ?

(OM-A 8.9.7.2)

Visual Reference Requirements after MDA or DA/H

To continue an approach below MDA or DA/H:

For non-precision approaches: For precision approach CAT I:	At least 1 of the following visual references for the intended runway must be distinctly visible and identifiable to the pilot: ● element of the approach light system ● threshold ● threshold markings ● threshold lights ● threshold identification lights ● visual glide slope indicator ● touchdown zone or touchdown zone markings ● touchdown zone lights.

162. State the required visual references for an ILS CAT II or ILS CAT IIIA ?

(OM-A 8.9.7.2)

Visual Reference Requirements after MDA or DA/H

To continue an approach below MDA or DA/H:

For non-precision approaches: For precision approach CAT I:	At least 1 of the following visual references for the intended runway must be distinctly visible and identifiable to the pilot: ● element of the approach light system ● threshold ● threshold markings ● threshold lights ● threshold identification lights ● visual glide slope indicator ● touchdown zone or touchdown zone markings ● touchdown zone lights.
For precision approach CAT II:	A segment of at least 3 consecutive lights of the following is attained and can be maintained: ● centerline of the approach lights ● touchdown zone lights ● runway center line lights ● runway edge lights ● a combination of these lights. The visual reference must include a lateral element of the ground pattern, i.e. an approach lighting crossbar or the landing threshold or a barrette of the touchdown zone lighting.
For precision approach CAT III:	For CAT III A and for CAT III B operations conducted either with fail-passive flight control systems or with the use of an approved HUDLS: at DH, a segment of least three consecutive light being: ● CL of the APL; or ● TDZL; or ● RCLL; or ● REDL; or ● a combination of these is attained and can be maintained by the pilot. For CAT III B operations conducted either with fail-operational hybrid landing system using a DH: at DH, at least one center line light is attained and can be maintained by the pilot. For CAT III B operations with no DH there is no specification for visual reference with the runway prior to touchdown.

Notes: 1. If after having attended visual reference, the reported VIS/RVR is falling below minima, a go-around shall be initiated unless a landing is considered safer than a low altitude go-around.

2. When no missed approach procedure is published, the procedure to use is left to the P-i-C's discretion, except for circling approaches.

163. For CAT II/ III approach, the RVR shall be measured by transmissometer or other such means. if more than one RVR value is given for the same runway, which RVR determines the minima for landing ?
(OM-A 8.9.7.3)

Visibility

- Visibility refers to meteorological visibility, or RVR.
- Visibility is the only criteria (Except for circling, see Requirements above.) to continue an approach before the Outer Marker or equivalent position.

RVR

- RVR is applied whenever given.
- For CAT II/III approach, the RVR shall be measured by transmissometer or other such means.
- If more than 1 RVR value is given for the same runway, the RVR at the threshold determines the minima for landing.

164. What does ceiling refers to ? (OM-A 8.9.7.3)

Ceiling

Ceiling refers to a cloud amount of "broken" or more.

Ceiling & Vertical Visibility

When both ceiling and vertical visibility are given:

- the highest value is applied
- whenever the threshold cloud base/vertical visibility is reported, this value is applied for instrument approach to that runway.

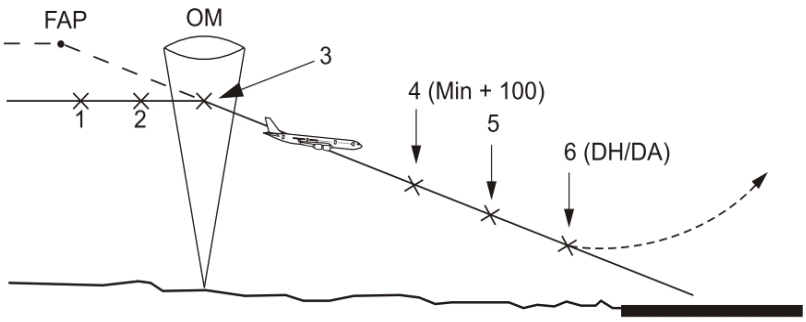
165. During automatic approach at plus hundred, who is to start dividing attention between flight monitoring and lookout for visual guidance? What will be his call out ?
(OM-A 8.9.7.5.1)

Automatic Approach Procedure

An automatic approach shall be made according to the following procedures in order to attain a uniform crew coordination.

PF	POS	PM
● Check clearance. ● Brief on: – approach procedure – setting of NAV aids – crossing altitudes – minima – missed approach procedure	1	● Confirm briefing. ● Check NAV aids.

● Select appropriate AP and FD modes.	2	● Check AP and FD modes
● Check correct aircraft configuration and establishment on ILS. ● Check and confirm altitude over OM or equivalent position.	3	● Check altitude over OM or equivalent position.
Approach with DH/DA		
● **Start to divide attention between flight monitoring and lookout for visual guidance.**	4	● Advise PF of approaching minimum (Refer to barometric altimeter for CAT II/III minima.) ● Continue to monitor AP and flight instruments.
● Advise PM when sufficient visual guidance for landing has been obtained.	5	● Continue to monitor AP and flight instruments.
At DH/DA: ● advise PM and state intention whether sufficient visual guidance for landing has been obtained or not.	6	At DH/DA: ● advise PF of reaching minimum if PF does not obtain sufficient visual guidance ● continue to monitor flight instruments and aircraft configuration.



166. In low visibility approaches, what shall we do to reduce the blinding effect caused by high intensity approach or runway lights ?
(OM-A 8.9.7.5.5)

High Intensity Lights
Follows the glide path in order to obtain the earliest contact with the approach lights.

Caution: **Aircraft entering the glide path from above or below will risk sudden blinding by the lights during an approach.**

- Be aware of the approach lighting system in use at the runway selected in order to quickly establish correct visual reference.
- RVR is based on max intensity the runway lights.
- Do not ask to dim the runway lights when landing under minimum visibility conditions as any attained visual reference may thereby be lost.

167. What is the primary reference, if both the ILS glide path and the PAPI/ VASI are available ?

(OM-A 8.9.7.5.6)

Visual Approach Slope Indicator System (VASIS)/Precision Approach Path Indicator (PAPI)

- The glide path shall be closely followed.
- Due to system tolerances, as well as differences in eye-to-wheel height of various aircraft types, deviations from the ideal glide path may occur close to the ground.
- A constant aiming point shall be selected slightly further down the runway from the normal VASIS touchdown point.
- The use of full flaps is recommended.
- The threshold crossing height could be somewhat lower than normal.
- VASIS /PAPI should be disregarded when an ILS glide path is available.
- Under certain weather conditions, e.g. smog, haze, dust, the red light propagation might be reduced and the white output might dominate.

168. Can we use precision approach path indicator (PAPI) until touchdown ?

(OM-A 8.9.7.5.6)

Visual Approach Slope Indicator System (VASIS)/Precision Approach Path Indicator (PAPI)

PAPI and APAPI (Precision Approach Path Indicator)

- PAPI are called APAPI if consisting of two lights only.
- PAPI are normally installed on the left side of runway.
- PAPI may be used by all aircraft down to 200 ft.

For specific detail, refer to RM/LAT.

169. Explain how a CANPA (Constant Angle Non-Precision Approach) is conducted ?

(OM-A 8.9.7.9)

Constant Angle Non-Precision Approach (CANPA)

It is now accepted by FAA and ICAO that a stable descent profile during the final approach segment through landing or initiating a go-around will provide a safer means of accomplishing non-precision approaches in the following ways:

- the aircraft remains in a stabilized descent profile throughout the final approach segment
- the pilot's attention is focused primarily on the altimeter
- procedures, profiles and callouts for visual, precision and non-precision approaches are standardized.

CANPA shall be performed during non-precision approach, except for circling approaches, level flight segments below 1,000 ft AGL should be avoided, and any sustained deviation from the planned descent rate of greater than 300 fpm will require a go-around.

CANPA procedure can be flown either as a DME-approach or as a timed approach, utilized a predetermined constant descent angle from Final Approach Fix (FAF) to a published Minimum Descent Altitude (MDA).

In conjunction with CANPA procedure, the Visual Descent Point (VDP) and Decision Point (DP) concepts are introduced and shall be taken into account.

170. How can we increase the safety margin in case a go-around has been made from altitude below minima or beyond missed approach ?

(OM-A 8.9.8)

Go-around

- Make the decision to abandon an approach as early as possible.
- Once the decision is made, it must not be changed.
- A go-around once commenced, must be completed.
- No attempt shall be made to reestablish an abandoned approach.
- PM/PM shall monitor that the go-around is performed in accordance with established procedures.
- In case PM/PM has taken over the controls from PF in order to make a go-around, no further change of control shall be made until the go-around is completed.
- If a go-around is initiated after touchdown, the performance requirements cannot always be ascertained.
- A go-around shall be initiated as early as possible.
- Do not initiate a go-around after the aircraft has settled firmly on the ground.

Exception:

- training flights with a qualified flight instructor as P-i-C may make touch-and-go landings during scheduled training flights.

Cautions: 1. Go-around from altitude BELOW MINIMA or beyond MAP may not always provide terrain clearance even with all engines operating when following missed approach procedure in the approach chart.

2. Missed approach shall be performed in accordance with SID or EOSID whenever published.

171. When shall a go-around be made from an ILS approach ?

(OM-A 8.9.8.1)

Go-around on ILS Approach

The approach shall be abandoned and a go-around be commenced if:

- the official visibility is below the applicable Company minima at the Outer Marker or equivalent position, or at 1,000 ft AGL if no OM
- the approach is not stabilized at approximately 1,000 ft AGL
- at DH/DA, the pilot is unable to make a landing by using visual guidance
- visual guidance is lost below DH/DA
- at CAT I minima on CAT II approach, requirements for CAT II are not fulfilled and visual guidance not obtained
- at minimum plus 100 ft on CAT II approaches, requirements for CAT II are not fulfilled
- on CAT III approaches, if requirements not fulfilled at 1,000 ft AGL
- at CAT II/III minimum, if the crosswind component measured on ground when passing DH exceeds 10 kt.

172. When shall a go-around be made from approaches without glide path reference ?

(OM-A 8.9.8.2&4)

Go-around on Approach without Glide Path Reference

The approach shall be abandoned and a go-around be commenced if:

- the official visibility is below the applicable Company minima before reaching FAF
- not stabilized at 1,000 ft AGL (CANPA)
- when reaching DP, the pilot is unable to make a landing by using visual guidance (CANPA)
- visual guidance is lost below MDA.

The approach must not be continued at MDA to a position closer to the runway unless the pilot is able to descend visually at normal sink rate.

Go-around on Instrument Approach for Circling

The approach shall be abandoned and a go-around be commenced if:

- the official visibility and/or ceiling is below the applicable Company minima at outer marker or equivalent position
- no contact when reaching an estimated position from which a normal or special circling pattern
  can be followed
- if visual reference is lost while circling to land from an instrument approach. The missed approach specified for that particular procedure must be followed
- make an initial climbing turn toward the landing runway and overhead the airport where the aircraft proceeds climbing on the missed approach track.

Go-around on Visual Approach

The approach shall be abandoned and a go-around be commenced if:

- the official visibility is below the applicable Company minima
- the approach is not stabilized at 1,000 ft AGL (straight-in approach) or 500 ft AGL (non-straight-in approach)
- at any time during a visual approach, the required visual reference is lost.

173. What is expected when visual reference is lost while circling ?

(OM-A 8.9.8.3)

Go-around on Instrument Approach for Circling

The approach shall be abandoned and a go-around be commenced if:

- the official visibility and/or ceiling is below the applicable Company minima at outer marker or equivalent position
- no contact when reaching an estimated position from which a normal or special circling pattern can be followed
- if visual reference is lost while circling to land from an instrument approach. The missed approach specified for that particular procedure must be followed
- make an initial climbing turn toward the landing runway and overhead the airport where the aircraft proceeds climbing on the missed approach track.

174. Explain when you can perform a second approach after the first go-around ?

(OM-A 8.9.8.5)

Second Approach

- If the first go-around has been made due to weather conditions, the second approach shall only be commenced if the P-i-C has reason to believe that this approach will lead to a successful landing.
- More than two approaches are allowed if there is indication that conditions have considerably improved, giving greater probability of a successful landing.

175. When shall a change of control be made in case the P-I-C (acting as PNF) has taken over the controls from PF in order to make a go-around ?

(OM-A 8.9.8)

Go-around

- Make the decision to abandon an approach as early as possible.
- Once the decision is made, it must not be changed.
- A go-around once commenced, must be completed.
- No attempt shall be made to reestablish an abandoned approach.
- PM/PM shall monitor that the go-around is performed in accordance with established procedures.
- **In case PM/PM has taken over the controls from PF in order to make a go-around, no further change of control shall be made until the go-around is completed.**
- If a go-around is initiated after touchdown, the performance requirements cannot always be ascertained.
- A go-around shall be initiated as early as possible.
- Do not initiate a go-around after the aircraft has settled firmly on the ground.

Exception:

- training flights with a qualified flight instructor as P-i-C may make touch-and-go landings during scheduled training flights.

Cautions: 1. Go-around from altitude BELOW MINIMA or beyond MAP may not always provide terrain clearance even with all engines operating when following missed approach procedure in the approach chart.

2. Missed approach shall be performed in accordance with SID or EOSID whenever published.

176. What is considered by a stabilized approach ?

(OM-A 8.9.9)

Stabilized Approach

An approach is stabilized when the aircraft is flown:

- along the desired flight path in landing configuration
- with appropriate thrust setting, usually above idle, to maintain the desired flight path
- at the approach speed between VREF and VREF+ 20 kt
- while maintaining an acceptable rate of descent, and not exceeding 1,000 ft per minute
- when all briefings and checklist have been performed.

Notes:
1. *ILS approach must be flown within 1 dot of the glide slope and localizer. A CAT II/III Approach must be flown within the expanded localizer band.*
2. *Unique approach procedure or abnormal conditions requiring a deviation from the above elements of a stabilized approach require a special briefing.*
3. *All flights shall be planned to stabilize at 1,000 ft above airport elevation. They shall be stabilized by 1,000 ft above airport elevation in IMC or 500 ft in VMC. Only a small deviation for speed and thrust setting is allowed between 1,000 and 500 ft in VMC.*
4. *The approach that becomes non-stabilized or destabilized below 1,000 ft above airport elevation in IMC or 500 ft above airport elevation in VMC requires an immediate go-around.*
5. *During a circling approach, wings should be leveled on final when the aircraft reaches 300 ft above airport elevation.*

Visual meteorological conditions (VMC) are defined as:
- when above 3,000 ft or 1,000 ft above terrain, whichever is higher:
  – 1,500 m horizontally and 1,000 ft vertically from cloud
  – flight visibility 5 km below 10,000 ft and 8 km above 10,000 ft
- when below 3,000 ft or 1,000 ft above terrain, whichever is higher:
  – clear of cloud and in sight of the surface
  – flight visibility 5 km.

(ICAO Annex 2: Rules of the Air)

177. What impression can one get when landing in precipitation or drifting snow/sand in crosswind conditions ?

(OM-A 8.9.11)

Company Crosswind Limit for Landing

The maximum crosswind component for each aircraft type is according to respective FCOM but shall never exceed 30 kt.

In case of landing in visibility less than 3,500 m with RA/+RA condition and the braking action and runway conditions are not reported, the runway may be considered slippery or contaminated and the maximum crosswind limit is 20 kt.

Precipitation, Ground Fog, Blowing Snow or Blowing Sand

Precipitation, ground fog or drifting snow/sand in crosswind conditions may create a false impression of the direction of aircraft movement and thus the pilots may get an impression of no drift, though, in fact, a considerable drift is present.

178. How do we handle the problem when landing in crosswind with precipitation or drifting snow/sand conditions ?

(OM-A 8.9.11)

Precipitation, Ground Fog, Blowing Snow or Blowing Sand

Recommended procedures are to:
- make yourself aware of the existing situation
- do not use landing lights

- look well in front of the aircraft during touchdown and landing roll. Use runway lights for reference.

Refer also to the respective FCOM.

Use of Landing Lights

When landing in reduced visibility, the use of landing lights may cause reduced forward visibility due to the blinding effect and may also lead to disorientation.

In case of precipitation and crosswind, false impressions of drift can occur. The use of landing lights during landing in the above mentioned conditions is therefore not recommended.

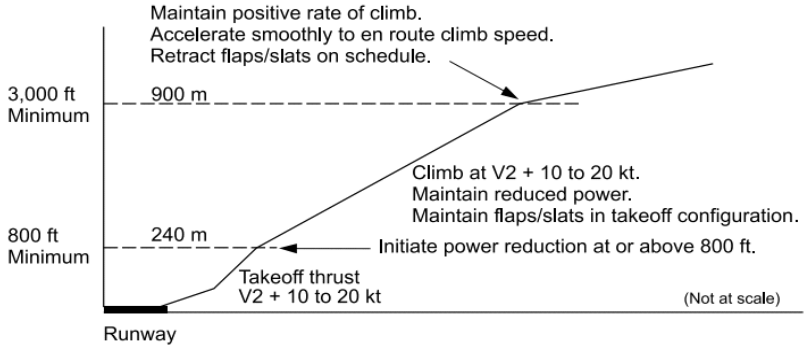
179. How many Noise Abatement Procedures exist and what are they ?

(OM-A 8.9.3.2.5), (RM 1.5.9.5)

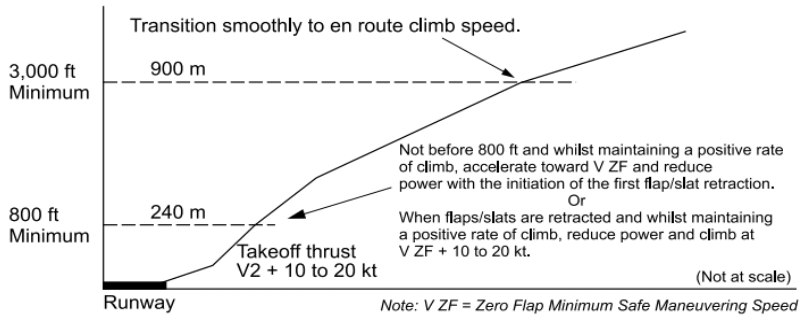
Noise Abatement Procedures

- Safety has priority over noise abatement.
- These procedures are designed to be simple and safe.
- No significant increase in crew workload during critical phases of flight.
- For each aircraft type, two departure procedures shall be defined:
  - Noise abatement departure procedure 1 (NADP 1), designed to meet the close-in noise abatement objective
  - Noise abatement departure procedure two (NADP 2), designed to meet the distant noise abatement objective.
- Each NADP climb profile can only have 1 sequence of actions.
- Pilot prompted by safety concerns can refuse a runway offered for noise preferential reasons.
- Abatement Procedures will not be conducted in conditions of significant turbulence or wind shear.
- Do not perform or no longer apply Noise Abatement Procedure, if conditions preclude the safe execution of the procedure and the minimum required obstacle clearance.
- Clearances and/or procedures designed for heading changes below 500 ft above the terrain shall not be considered acceptable.
- The bank angle for turns after takeoff is limited to 15° except when adequate provision is made for an acceleration phase permitting attainment of safe speeds for bank angles greater than 15°.
- Reduction of power for noise abatement purposes shall not be initiated earlier than specified in the respective FCOM.
- No turns should be required coincident with a reduction of thrust associated with a noise abatement procedure.
- No climb shall be executed at the airspeeds less than the maneuvering speed for the existing flap configuration.

NADP 1



NADP 2



(LIDO; General Part: Rules and Regulations)

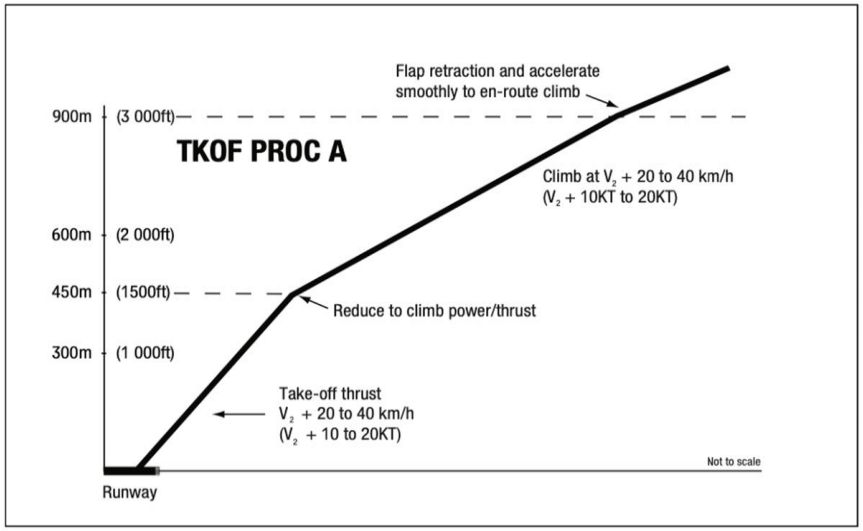
TKOF PROC A

The procedure below is the previous ICAO Noise Abatement Take-off Procedure A which is still applied at several aerodromes.

TKOF PROC A results in noise relief during the latter part of the procedures.

Whenever such procedure is applied at an aerodrome, it is referred to as "TKOF PROC A" in the Lido Route Manual AOI pages.

TKOF PROC A
TKOF to 1500ft (450m) AAE - TKOF power - TKOF flap - climb at V_2 + 10 to 20KT (V_2 + 20 to 40KMH) (or as limited by body angle)
At 1500ft (450m) - reduce thrust to not less than climb power/thrust.
1500ft to 3000ft (450m to 900m) - climb at V_2 + 10 to 20KT (V_2 + 20 to 40KMH)
At 3000ft (900m) - accelerate smoothly to en-route climb speed with flap retraction on schedule.



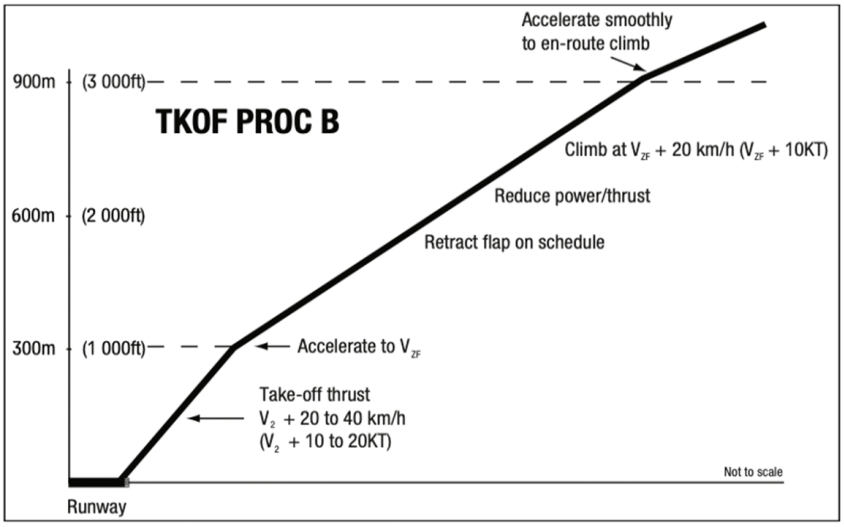
TKOF PROC B

The procedure below is the previous ICAO Noise Abatement Take-off Procedure B which is still applied at several aerodromes.

TKOF PROC B provides relief during that part of the procedure close to the airport.

Whenever such procedure is applied at an aerodrome, it is referred to as "TKOF PROC B" in the Lido Route Manual AOI pages.

TKOF PROC B
TKOF to 1000ft (300m) AAE - TKOF power/thrust - TKOF flap - climb at V_2 + 10 to 20KT (V_2 + 20 to 40KMH)
At 1000ft (300m) - maintain a positive rate of climb, accelerate to zero flap minimum safe maneuvering speed (V_{ZF}) retracting flap on schedule.
Thereafter, reduce thrust consistent with the following: a) for high bypass ratio engines, reduce to normal climb power/thrust; b) for low bypass ratio engines, reduce power/thrust to below normal climb thrust but not less than that necessary to maintain the final take-off engine-out climb gradient; and c) for aeroplanes with slow flap retracting, reduce power/thrust at an intermediate flap setting.
thereafter, **from 1000ft to 3000ft (300m to 900m):** - continue climb at not greater than V_{ZF} + 10KT (V_{ZF} + 20KMH)
At 3000ft (900m) - accelerate smoothly to en-route climb speed.
Note: Aeroplanes such as supersonic aeroplanes not using wing flaps for take-off should reduce thrust before attaining 1000ft (300m) but not lower than 500ft (150m).



180. What should the height over runway threshold be ?

(OM-A 8.9.11)

Height over Runway Threshold

In normal landing, the height over the runway threshold shall be about 50 ft with reference to wheel clearance above the runway.

If guided by an approved ILS glide path, the wheel height over the threshold may be lower than 50 ft as dictated by the vertical distance between the airborne glide path antenna and the landing gear.

When downdrafts are expected due to terrain or turbulent air, the height margin over threshold should be increased whenever excessive runway length is available.

181. What is the guideline procedure for normal and abnormal situation in a Two Man Flight Deck ?

(OM-A 8.11.2)

Task Sharing

Flight Crew members shall perform their flight duties in accordance with their assigned roles.

Guideline Procedure for Normal Situation

- PF shall always inform PM of his intention and action that is deviating from the Standard Operating Procedure (SOP).
- PF clearly announces AFS and FMS, if equipped, selection.
- PM shall callout automatic switching.
- PM shall always monitor all instruments while PF is flying.

Guideline Procedure for Abnormal Situation

- The pilot detecting any impending or existing abnormality or emergency situation shall immediately inform the other pilot.
- Before an emergency or malfunction procedure is initiated, the affected system shall be rechecked for a normal set-up and all available indications shall be rechecked to confirm the problem.
- Aural warning should be silenced, preferably by PM after the identification of the problem.

- In order to reduce any risks of creating errors and mistakes through preoccupation, pilots shall perform their flight duties as closely as possible to what is stated in the normal situation case. If the P-i-C deems it necessary, he may assume the PF duties for further details of operation, refer to FCOM.

Note: Specific task sharing is permitted as specified in the respective FCOM.

182. What are the differences between ATC clearances, ATC instructions, and ATC approvals ?

(OM-A 8.10.4.2)

ATC Clearances, Instructions and Approvals

All ATC clearances, instructions and approvals are defined to cover different demands:

- ATC clearance is an **AUTHORIZATION** by an ATC unit for an aircraft to proceed under conditions specified
- ATC instruction is a **DIRECTIVE** issued by an ATC unit for the purpose of requiring pilots to take specified actions to be adhered to and carried out without undue delay
- ATC approval is a **PERMISSION** from an ATC unit for proposed action.

For detailed information on pilot read back, monitoring etc., refer to RM/COM.

183. How to identified and what shall you do if your passengers or crew suspected to be communicable disease ?

(OM-A 8.10.4.6)

Suspected Communicable Disease Report

General

Passengers and crew may have been exposed to a communicable disease if they have a fever (temperature 38 deg. C/100 deg. F or greater) associated with certain signs or symptoms, e.g. appearing obviously unwell, persistent coughing, impaired breathing, persistent vomiting, etc.

Purpose

To facilitate provision for the presence of special medical personnel and equipment necessary for the management of public health risks upon arrival of the flight, as recommended by ICAO.

Notification of Suspected Communicable Diseases or other Public Health Risk on Board an Aircraft

In the event of a case of suspected communicable diseases or other public health risk on board an aircraft, the P-i-C shall, before arrival of the flight, promptly notify the ATC with which they are communicating, giving all available information listed below:

- aircraft identification
- departure aerodrome
- destination aerodrome
- estimated time of arrival
- number of persons on board
- number of suspected cases on board
- nature of the public health risk.

Refer to PANS ATM Doc 4444 16.6.1.

184. What is the difference in reading the Emergency Checklist from the Normal Checklist ?

(OM-A 8.10.1)

Use of Checklist and Standard Terminology

General

In order to ensure a safe, correct and fast handling and operation under different conditions, the following special checklists are available in the flight deck:

- normal checklist/Mini Normal checklist
- emergency/Malfunction checklist/QRH (may also be occasionally known as Non-normal Procedure).

The checklists are standard equipment in the flight deck and shall, when not in use, be stored in accordance with the Standard Loose Equipment Lists. Normal checklist shall be used on all flights, and Emergency/Malfunction checklist/QRH when situation so requires.

As a general rule the Emergency checklist has priority over the Malfunctioning/Abnormal checklist which again has priority over the Normal checklist. If a situation arises during checklist reading, calling for a checklist with higher priority, then the lower priority checklist shall be interrupted and the higher priority check list shall be read before reverting to the one of lower priority. Similarly, the highest priority checklist determines the position of a switch, selector, lever or control, and this position cannot be changed by a subsequent, lower priority checklist.

If a situation is not covered in the checklists or the FCOM, the course of action is left with the P-i-C.

Normally reading of checklists should not take place below 1,000 ft AGL, memory items excluded.

If reading of checklist has to be interrupted for any reason, the checklist shall be put in a conspicuous place as a reminder that it has not been completed.

The checklist items shall be read in chronological order. Some items may be read and not performed (e.g. altimeter setting). This requires that the checklist is placed in a conspicuous place. When completing the checklist, it must be reread with the required action and response, then “checklist completed”.

Some aircraft types are equipped with the electronic checklist system.

Note: Specific terminology/callout is permitted as specified in the respective FCOM.

Use of Normal Checklist

PF shall, with the exception below, order Normal checklist reading for each specific phase of operation as specified in Normal and/or Expanded checklist, Normal Procedure or SOP. To save time on ground, however, any other qualified crew member may initiate and perform the section "Flight deck/Cockpit preparation" and certain items on the "Prestart/Before Start" checklist as specified in Normal and/or Expanded checklist, Normal Procedure or SOP.

All checklist items requiring an action/answer from another crew member shall be called in a distinct, loud, and fluent manner.

All items from "Crew at Their Stations/Before Start" until "Parking" shall be read out loudly, irrespective of who is to perform the required action.

When a checked item is called, the crew member concerned shall look at the switch, control lever, gage, etc., set it or read it as appropriate, and then read the checked reply.

The action relating to an item may, for practical reasons, be performed in advance and when later that checked item is called, the appropriate setting or action shall be ascertained.

Note: This must, under no circumstances, be interpreted that the items may be read in advance.

It is necessary that the crew take time to check each item properly.

No matter how great the hurry is, the reading crew member must always wait when calling a checked item until the correct reply to the preceding item is received.

If an incorrect reply to a checked items is given, the item, including the correct reply, shall be repeated and read aloud by the reading crew member, and the item shall be rechecked.

The crew member reading the checklist is responsible for its correct use and shall insist upon the correct replies to all items of the appropriate part of the checklist.

When checklist is completed, PNF shall announce the checklist completion as defined in respective FCOM.

After each "Checklist completed", the checklist shall be returned to the appropriate checklist holder.

Use of Emergency/Malfunction or Emergency/Abnormal checklist
A “memory” item shall be performed without reference to checklist, normally not below 500 ft AGL.

In order to ensure prompt and correct action in case of an emergency, the crew member reading the Emergency/Malfunction or Emergency/Abnormal checklist or calling out the “Memory” items shall call out both the checked items and the actions listed in the checklist.

The reading crew member shall further ensure that all items are covered, either by personally checking each item or by receiving a read-back from the appropriate crew member.

The read-back shall consist of the action taken, and when the number or the position of an engine, throttle or system, etc., is involved, the significant parts of the checked items shall also be included in this read-back, in accordance with the terminology in the related Emergency/Malfunction or Emergency/Abnormal checklist.

Note: Depending on aircraft types, different nomenclature e.g. thrust levers, fire switches may be used.

The “Memory” items shall be rechecked against the Emergency/Malfunction or Emergency/ Abnormal checklist before proceeding with the subsequent checklist items.

When the procedure is completed, PM shall announce the procedure completion as defined in respective FCOM.

During takeoff and climb out, to achieve an efficient and coordinated effort, the Emergency checklist actions shall normally be carried out as follows:

- PF shall concentrate on flying the aircraft and order the applicable Emergency checklist
- PM shall call out the “memory” items on the ordered checklist while continuing to monitor the Flight

- PM shall carry out the items of the ordered Emergency checklist.

In order to maintain a good knowledge of the items on the Emergency/Malfunction or Emergency/ Abnormal checklist, it is recommended that the P-i-C review these procedures with his flight crew, in particular, the items in connection with the “Emergency Evacuation” procedure.

185. What are the restrictions of screens usage ?

(OM-A 8.10.2.2)

Lookout

When weather conditions make it possible, it is the duty of crew members to keep a sharp lookout during all stages of flight.

However, at least one crew member must, at all times, ensure the safe maneuvering and monitoring of the aircraft.
In the vicinity of and during descent and climb to/from the same airport, and in heavy traffic areas, crew members shall avoid paper work, map reading, etc.

When flying in VMC on an IFR flight plan, the P-i-C is still responsible for avoiding collision with other aircraft.

Keep in mind that information about essential traffic only includes known traffic. It is important to sharpen the lookout for this traffic but do not forget that other traffic may exist.
However, information about the traffic within the “dead angles” of the aircraft” (aircraft on approximately the same heading) is always valuable and shall be requested as the traffic cannot be seen and, therefore, strict attention is necessary.

Note: Except authorized sun visors, placing of any objects on the glare shield, windshield and side windows is strictly forbidden, as it will obstruct the visibility.

186. Does the estimated time over a given point reported to ATC that is in error of more than 2 minutes need to be revised in every country ?

(OM-A 8.10.2.5)

Deviation from Flight Plan

Changes of flight plan shall be reported to ATS as soon as practicable. If communication or navigation equipment degrades to such an extent that the flight cannot be carried through according to flight plan, the appropriate ATC function shall be informed without delay.

Inadvertent deviations from the current flight plan shall be correctly reported as follows:

- if the flight is off track, take action to regain track as soon as practicable
- if average true airspeed varies by 5% or more from that given in-flight plan, inform ATS
- if any estimated time given is in error by more than 2 min, notify ATS.

187. Distinguish between communication failure in VMC and IMC when not stated in country's rules and procedures ?

(OM-A 8.10.2.6), (RM 1.7.2.2)

Communication Failure

In case of COM failure, ATC will maintain separation based on the assumption that the aircraft having COM failure will proceed as follows:

In VMC, the aircraft shall

- continue in VMC and land at the nearest suitable aerodrome

In IMC, or if flight cannot be completed in accordance with VMC conditions above, the aircraft shall

- Proceed according to the current flight plan to the NAV aids serving aerodrome of intended landing and hold until the commencement of descent.
  Note: Current flight plan is the flight plan, including changes if any, brought about by subsequent clearances.

If the clearance for the flight levels covers only some parts of the route, the aircraft is expected to maintain the last assigned and acknowledged cruising level(s) to the point specified in the clearance and thereafter:

- commence descent as closely as possible to the expected approach time, or, if no expected approach time acknowledged, as closely to the ETA as possible
- complete a normal instrument approach procedure
- land, if possible, within 30 minutes after ETA or last acknowledged expected approach time, whichever is later.

(LIDO; General Part: Communication 1.7.2.2)
Air-Ground Communication Failure (ICAO Doc 4444)

Transponder Code 7600
An ACFT equipped with an SSR transponder is expected to operate the transponder on Mode A Code 7600 to indicate that it has experienced air-ground communication failure. An ACFT equipped with other surveillance system transmitters, including ADS-B and ADS-C, might indicate the loss of air-ground communication by all of the available means.

Some ACFT equipped with first generation ADS-B avionics have the capability to transmit a general emergency alert only, regardless of the code selected by the pilot.

In Visual Meteorological Conditions (VMC):

a) continue to fly in VMC;

b) land at the nearest suitable aerodrome; and

c) report its arrival by the most expeditious means to the appropriate ATS unit; or

In Instrument Meteorological Conditions (IMC):
or when conditions are such that it does not appear likely that the pilot will complete the flight in accordance with VMC procedures above:

a) unless otherwise prescribed on the basis of a regional air navigation agreement, **in airspace where procedural separation is being applied**, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of **20min** following the ACFT's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan; or

b) **in airspace where an ATS surveillance system is used** in the provision of ATC, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of **7min** following:
   - the time the last assigned level or minimum flight altitude is reached; or

- the time the transponder is set to Code 7600 or the ADS-B transmitter is set to indicate the loss of air-ground communication; or
- the ACFT's failure to report its position over a compulsory reporting point;

whichever is later and thereafter adjust level and speed in accordance with the filed flight plan;

c) when being vectored or having been directed by ATC to proceed offset using RNAV without a specified limit, proceed in the most direct manner possible to rejoin the current flight plan route no later than the next significant point, taking into consideration the applicable minimum flight altitude;

d) proceed according to the current flight plan route to the appropriate designated NAVAID or fix serving the destination aerodrome and, when required to ensure compliance with e), hold over this aid or fix until commencement of descent;

e) commence descent from the NAVAID or fix specified in d) at, or as close as possible to, the EAT last received and acknowledged; or, if no EAT has been received and acknowledged, at, or as close as possible to, the ETA resulting from the current FPL;

f) complete a normal IAP as specified for the designated NAVAID or fix; and

g) land, if possible, within 30min after the ETA specified in e) or the last acknowledged EAT, whichever is later.

188. Shall we switch the anti-collision light to off when the aircraft is to be towed to the gate with engines shut down ?

(OM-A 8.10.2.7), (RM 1.5.2.6.2.4)

Use of Aircraft External Lights

Certain aircraft external lights should be used in various combinations to signal whether the aircraft is on a taxiway, on a runway, crossing an active runway, or moving down the runway for takeoff. Aircraft external lights must not be switched ON and OFF during fueling operations.

To make an aircraft operating on the airport surface more conspicuous but not adversely affect the vision of other pilots/ground personnel, pilots should illuminate the aircraft external lights for each aircraft activity during Day (○) and night or IMC (●) operations as shown in the table below or follow the procedures in respective FCOM for each aircraft type:

External light Activity	Rotating Beacon	NAV Lights	Strobe Lights	Landing Lights	Taxi (RWY turnoff) Light	Logo Lights
Engine(s) running	● ○					
Prior to taxi	● ○	●				●
Taxi	● ○	●			● ○	●
Crossing RWY	● ○	●	● ○	● ○	● ○	●
Line up and wait	● ○	●	● ○		● ○	●
Takeoff	● ○	●	● ○	● ○	● ○	●
Landing	● ○	●	● ○	● ○	● ○	●

Note :

- Strobe lights shall be turned off after landing and vacated from the active runway.

- Use of landing lights is recommended when below 3,000 ft AGL.
- Use of other external light such as wing lights is recommended day and night below FL100 and during aircraft movement on ground.

(LIDO; General Part: RAR)

Lights to be Displayed by Aircraft

a) Except as provided by e), from sunset to sunrise or during any other period which may be prescribed by the appropriate authority all aircraft in flight shall display:
   1) anti-collision lights intended to attract attention to the aircraft; and
   2) navigation lights intended to indicate the relative path of the aircraft to an observer and other lights shall not be displayed if they are likely to be mistaken for these lights.

b) Except as provided by e), from sunset to sunrise or during any other period prescribed by the appropriate authority:
   1) all aircraft moving on the movement area of an aerodrome shall display navigation lights intended to indicate the relative path of the aircraft to an observer and other lights shall not be displayed if they are likely to be mistaken for these lights;
   2) unless stationary and otherwise adequately illuminated, all aircraft on the movement area of an aerodrome shall display lights intended to indicate the extremities of their structure;
   3) all aircraft operating on the movement area of an aerodrome shall display lights intended to attract attention to the aircraft; and
   4) all aircraft on the movement area of an aerodrome whose engines are running shall display lights which indicate that fact.

c) Except as provided by e), all aircraft in flight and fitted with anti-collision lights to meet the requirement of a) 1) shall display such lights also outside the period specified in a).

d) Except as provided by e), all aircraft:
   1) operating on the movement area of an aerodrome and fitted with anti-collision lights to meet the requirement of b) 3); or
   2) on the movement area of an aerodrome and fitted with lights to meet the requirement of b) 4);shall display such lights also outside the period specified in b).

e) A pilot shall be permitted to switch off or reduce the intensity of any flashing lights fitted to meet the requirements of a), b), c) and d) if they do or are likely to:
   1) adversely affect the satisfactory performance of duties; or
   2) subject an outside observer to harmful dazzle.

189. What is the unruly/disruptive (disorderly) passengers ?

(OM-A 10.2.3.1)

Unruly/Disruptive (Disorderly) Passengers

General

Unruly and disruptive passengers can be a threat to security and safety of our flights, passengers and personnel.

Passengers are considered as “unruly/disruptive” when they:

- repeatedly refuse to comply with instructions given by the crew, or
- behave in such a way that causes discomfort to other passengers, threaten the flight safety or constitutes a serious offence.

Company Policy

Since disorderly or intoxicated behavior aboard the aircraft conflicts with THAI's goal "safe and secure airline" and will lower the level of customer satisfaction felt by other passengers, then:

- THAI will not tolerate unruly and disruptive passengers and will follow the ICAO Conventions on Offences and Acts of Unlawful Interference or certain other Acts Committed aboard Aircraft
- the Company will empower crew members to take responsible steps to prevent, handle and deal with passengers who have potential for creating disturbance aboard the aircraft
- the Company will encourage the police or authorities to prosecute unruly/disruptive passengers in appropriate cases, especially when any verbal/physical assault is committed on THAI staff
- all THAI crew members and ground staff shall be properly trained to deal with unruly/disruptive passengers
- the Company will assist and support crew members who are required to give witness statements to police or to appear in court after the case. Such assistance are:
  – time spent on giving statements to police is deemed to be duty-time
  – legal advice is available to crew member called to testify in any court
  – applicable expenses incurred in court attendance will be absorbed by the Company.
- appropriate information shall be given to the traveling public regarding seriousness and consequences of inappropriate and unacceptable behavior.

Handling Procedures

Each unruly/disruptive case is different and requires a unique response. Therefore, a careful judgment in handling the situation is essential to a solution to the case.
Procedures for handling unruly/disruptive passengers for ground staff and cabin crew are already published and circulated to all staff concerned:

- ground staff shall refer to "The Guideline of Handling Procedure for Disruptive/Unruly Passenger for Ground Staff"
- cabin crew shall refer to "Passenger Service Manual (PSM)".

190. What is the handling procedures in case of unruly/disruptive (disorderly) passengers ?

(OM-A 10.2.3.3)

Unruly/Disruptive (Disorderly) Passengers

Handling Procedures

Each unruly/disruptive case is different and requires a unique response. Therefore, a careful judgment in handling the situation is essential to a solution to the case.
Procedures for handling unruly/disruptive passengers for ground staff and cabin crew are already published and circulated to all staff concerned:

- ground staff shall refer to "The Guideline of Handling Procedure for Disruptive/Unruly Passenger for Ground Staff"
- cabin crew shall refer to "Passenger Service Manual (PSM)".

Before Flight

During embarkation, the passenger engaged in disorderly conduct or apparently intoxicated shall be observed and, if necessary, refused for embarkation or off-loaded.

If such passenger is to be off-loaded, the following procedures shall be applied:

- if the aircraft is on the parking bay, P-i-C, IM or Purser shall inform the gate lounge staff for further action
- if the aircraft is maneuvering on ground, the P-i-C shall inform ground staff via CUT channel and taxi the aircraft to the assigned parking bay
- IM/Purser must complete the Flight Disturbance Incident Report (FDIR).

In Flight

According to the Tokyo Convention, Article 5, the term “in flight” means at any time from the moment when all its external doors are closed following embarkation until the moment when any such door is opened for disembarkation.

Under the Tokyo Convention, chapter III, “Power of the Aircraft P-i-C”, the P-i-C should be thoroughly familiar with the powers bestowed on them and these powers should be exercised whenever warranted.

While in flight, the handling of unruly/disruptive passengers is at the discretion of the P-i-C and in coordination with the senior cabin crew.

191. What should be done in case of handling of sabotage treats ?

(OM-A 10.2.1.1)

Bomb Threat

General Provisions

Initial information about all kinds of acts of unlawful interference against THAI has to be reported immediately to THAI Crisis Management & Operations Centre (CMOC) or BKKOPTG (if CMOC is not possible).

Fast establishment of contact between the threat assessors team and the flight crew is the main objective when dealing with bomb threats. If no direct contact is possible, contact may be established via BKKOP or local station management.

If no contact can be established within the reasonable time, the P-i-C in cooperation with the station management/local authorities/handling agent is responsible for assessing the threat and for deciding on the necessary action. Such decisions must be transmitted as soon as possible to BKKOP.

If the assessment of THAI Security leads to a classification of specific threat, following guidance shall be applied:

- Bomb threat against:
  – Aircraft on ground.
  – Aircraft in flight.

Procedures for Aircraft on Ground

If the bomb threat has been classified as specific by the authorities/THAI:

- during taxi, taxi back to the parking area or to a specially assigned parking area as a vised by ground control. The authorities (security/ airport) communicate decisions/measures to be taken primarily by the tower or apron control and subsequently inform and instruct the flight crew about next steps

- summon senior cabin crew to the flight deck and advise about the situation and relevant action to be taken
- make PA announcement as given in the P-i-C announcement. It is of utmost importance that the P-i-C explains the situation to the passengers in a calm and reassuring manner
- disembark the passengers in an expeditious and orderly fashion. The passengers should be advised to bring along their hand baggage. However, if it has been decided to use evacuation slides, the hand baggage shall be left aboard
- in case of evacuation, the Aircraft Security Search Checklist shall be taken along with the Co-pilot in order to be readily available for a following search of the aircraft
- cabin crew and ground personnel will be responsible for moving passengers to a safe area (distance of 200 meters from the aircraft is considered safe for unprotected persons)
- the aircraft should be removed to a designated remote parking area according to local regulations and procedures
- after expiry of the cooling-off time, unload and removal of all goods in the aircraft (hold baggage, cargo, catering, etc.)
- aircraft bomb search by authorities, assisted by crew and maintenance personnel (if required).

When a suspicious article is discovered, the possibility of a secondary device should not be discounted.

Do not move the suspicious article until assured that the article can be moved.

When unloading and search have been completed, and no suspicious article or incident has been encountered, the station management shall release the aircraft for operation and notify all functions concerned.

Procedures for Aircraft in Flight

If the bomb threat has been classified as specific by the authorities/THAI:

- immediate landing is possible (within 30min)
  - inform cabin crew accordingly and make an announcement that landing for operational reason has to be made
  - no in flight search
  - land as soon as possible
  - decision about disembarkation/evacuation
  - follow instructions given by the local authorities
- immediate landing is not possible
  - perform the applicable aircraft checklists and procedures if feasible with regard to other safety requirements
  - initiate a full in flight search for cockpit and cabin (Aircraft Security Search Checklist placed in certificate holder)
  - make a suitable passenger announcement and request the passengers to remain in their seats and to cooperate with the crew.

In the event no suspect device found in flight, the following actions are to be taken:

- land as soon as possible at the nearest adequate aerodrome
- decision about Disembarkation/Evacuation
- follow instructions given by the local authorities.

In the event suspect device found in flight, the following actions are to be taken:

- cabin crew: if possible, move suspect device to LRBL (least risk bomb location) as per checklist
- land as soon as possible at the nearest adequate aerodrome
- decision about disembarkation/evacuation
- follow instructions given by the local authorities.

Aircraft Bomb Search Checklist/The Aircraft Security Search Checklist (AVSEC FORM 10)

Aircraft security search is a thorough inspection of the interior and exterior of an aircraft for the purposes of discovering suspicious objects, weapons, explosives or other dangerous devices, articles or substances.

When a search of an aircraft is required due to a sabotage threat, the competent local security authorities shall be requested to carry out such a search assisted by Ground Engineers of THAI or the Handling Agent, holding a license for the aircraft type. The search team may be supplemented by local THAI staff, deemed suitable by the THAI Station Management.

The Corporate Aviation Security Department (BKKJS) is responsible for developing and maintaining the Aircraft Security Search Checklist known as AVSEC FORM 10 in accordance with the ICAO guidance and the manufacturer document. The checklist must be approved by the Vice President of Aviation Safety, Security & Standards Department (BKKDJ).

The Aircraft Security Search Checklist (AVSEC FORM 10) is contained in a certificate holder on board each aircraft together with the airworthiness and registration certificates.

The examples of areas to be searched are aircraft interior, forward entrance, flight deck companionway, forward compartment, forward galley, forward toilets, main cabin, centre galley and bar, rear galley area and bar, aft toilets, aft wardrobes and coatrooms, aircraft exterior—fuselage, cabin compressor compartment, accessory compartment, cargo compartment, landing gear wheel wells and gears, wings, engines and pylons.

Note: *Refer to SPM 8.4—Guidelines for Aircraft Security Search and SPM 11.10—Guidelines for Aircraft Security Search Checklist.*

192. What should be done in case of threat of hijacking on ground and in flight ?

(OM-A 10.2.2.2)

Threat of Hijacking

If a threat of hijacking is received, the following actions are recommended:

- At parking/boarding
  – disembark passengers in the normal way.
- During taxiing
  – return to ramp and coordinate with ground staff
  – do not inform the passengers of the reason for returning as this may aggravate a potential hijacker to take action.
- Airborne
  – verify and update the latest situation with OP/OW communication channel
  – briefing all flight crew to be prepared and ready to cope with all expected and unexpected Situations

– the flight should continue as planned and no action taken which might provoke a potential hijacker into unpremeditated action
– all crew members, including passive crew, should be alerted to keep a close watch on all passengers
– looking/searching for any suspicious objects both in the flight deck and cabin and P-i-C shall be immediately informed of any discovery
– pilot is not allowed to open flight deck door even though he is forced or pressed to do so. Allowance is for pilot toilet visit only and the following procedures are mandatory enforced:
1. Pilot informs cabin crew by interphone for a toilet visit.
2. Cabin crew verifies the passengers and cabin conditions are safe and secure for flight deck egress.
3. The flight deck entrance shall be obstructed by a device such as meal cart and must be guarded by 2 cabin crews facing toward the cabin. Curtain (if installed) shall also be closed.
4. When the toilet close to the flight deck is available and all safeguard measures are performed, cabin crew inform pilot to leave the flight deck and he/she shall stand by with the interphone until the pilot get back into the flight deck.
5. Pilot shall always wear an unofficial jacket whenever egress from the flight deck.
6. If any unusual situations or cabin conditions are observed cabin crew shall immediately informed the pilot in the flight deck, the pilot in the toilet must be called out.
– in any circumstances cabin crew must not allow the hijacker to access direct physical contact with the pilot
– no one shall be allowed to enter the flight deck.

Procedures for a Confirmed Hijacking

The circumstances of hijacking may vary, however, certain guidelines may be suggested:

- safety and care of our passengers, crew members, and aircraft is the primary objective
- out posture is one of passive resistance
- keep passengers in seats with seat belt fastened to avoid interference
- keep flight deck loudspeakers turned off to avoid confusion
- maintain normal ATC communication, giving as much information as possible
- follow the instructions of the hijacker but insist his demands to be within the capability of the aircraft and crew, regarding range, runway requirements etc.

Use of Transponder:

- squawk A7500 as soon as hijacking is evident, A7700 may be squawked to indicate that immediate assistance is required. Special signals are applicable in the U.S.A., in connection with a confirmed hijacking
- if unable to squawk A7500, use a special word “TRIP” preceding the call-sign
- flaps full down while on ground indicates that the situation is desperate.

Procedures on Ground After Landing

- After landing, the after landing and shutdown procedures should be completed as per SOPs.
- The P-i-C should keep the authorities advised of requirements and attempt to obtain the release of passengers and crew.
- The P-i-C must expect the police or other authorities to take control. It then becomes his duty

to comply with their instructions to the best of his ability consistent with the safety of his passengers and crew. The authorities will probably want to prevent the aircraft from taking off again. They will also be receiving technical advice and assistance from many sources, including THAI, whereas the P-i-C should recognize that his assessment of the situation is limited to the confines of the aircraft and the constraints to which he is subject to. Therefore, no independent action should be taken unless absolutely necessary.

- During negotiations, let the hijacker do his own thinking.
- Pay strict attention to hygiene within the cabin, galleys, and toilets. Try to keep doors, galleys and aisles clear of rubbish and equipment. Establish endurance of food, water, sanitary supplies and battery or APU. Transfer to a Ground Power Unit as soon as possible.
- Establish the medical condition of passengers and need for medical supplies. Make sure that both the hijackers and the authorities are aware of these requirements for the welfare of passengers.
- Every effort shall be taken to care for passengers and crew.
- Use fuel and mechanical problems to assist in slow down.
- Only when situation becomes extremely dangerous, should the crew attempt to regain control of the situation by violent action.

Special Crew Assignment

One crew member assigned to communicate with the hijacker shall:

- use great slow down and delay
- calm the hijacker
- become a neutral friend
- be honest
- encourage hijacker to talk
- reduce anxiety
- attempt to persuade hijacker to land and allow release of passengers
- try to determine numbers and types of weapons
- not serve alcoholic beverage to hijacker
- give only what the hijacker asks for.

Note: Do not negotiate, crew members are only the messengers.

Post-hijacking Procedures

Before press interview, the P-i-C, with approval from DO, is the one and only spokesman for the crew.

A full report of the incident shall be sent immediately by means of Security Incident Report (SIR) form.

193. What are the procedures for fuel jettison ?

(OM-A 8.11.7.1)

Fuel Jettison

Fuel jettison is an abnormal procedure and should be treated as such. It is an approved procedure and, if performed in accordance with applicable instruction in the respective FCOM, it does not

involve any hazard in itself. Other circumstances may, however, make fuel jettison hazardous or less desirable, e.g:

- a fire on board
- conditions of heavy static
- when flying in high density areas
- a risk of other aircraft flying through jettisoned fuel
- weather at airport of landing closing down.

Note: The examples mentioned above are not restricted to P-i-C decision to jettison fuel in order to reduce the landing weight under safety risk assessment.

194. What will pilot do in case of an explosive decompression ?

(OM-A 8.11.5)

Explosive Decompression/Emergency Descent

During flight at high levels, the pilots must prepare for an explosive decompression of the cabin. An emergency descent must be initiated immediately in order to protect the passengers. This aims at bringing the aircraft down rapidly to an altitude where the passengers can breathe normally.

When executing an emergency or other uncleared descent, consider turning away from the airway or designated track to avoid traffic at lower levels. Exercise caution in order not to exceed the stress limits of the aircraft in an emergency descent combined with high bank angles.

The descent should not be steeper than the situation warrants. Recommended initial level-off altitude is 14,000 to 10,000 ft, if terrain permits.

For further instruction, refer to FCOM.

195. When should an overweight landing be considered and not be considered ?

(OM-A 8.11.7.2)

Overweight Landing

Overweight landing in lieu of fuel jettisoned may, in many instances, be preferable in the interest of safety. An overweight landing may be considered, according to the respective FCOM, when the P-i-C finds this to be the best course of action.

With regard to safety, an overweight landing may, in many instances, be preferable to fuel burn-off.

Available runway length versus aircraft type has to be taken into account when considering an overweight landing on contaminated or slippery runways. If sufficient runway length is available and if the conditions permit a touchdown sink rate which is within the designed limits of the aircraft (less than 360 fpm), an overweight landing should not involve any hazard or result in any structural damage.

As a rule of thumb, the runway used for takeoff will also be sufficient for a subsequent overweight landing. By not exceeding 30° bank or flap placard speeds, an adequate strength margin will be ensured during an overweight landing.

The following are examples of some typical situations that an overweight landing should be considered:

- any malfunction or failure that would render the aircraft unairworthy
- any condition, mechanical or otherwise, or combinations thereof, where an expeditious landing would reduce the potential risk of experiencing additional problems which could result in a derogation or a compromise of safety
- serious illness of crew or passengers which would require immediate medical attention.

On the other hand, there are situations which are not qualified for an overweight landing, or when an overweight landing is less desirable, for example:

- marginal weather and/or runway conditions
- minor malfunctions, which do not affect the airworthiness of the aircraft, but preclude continuation of flight to destinations, e.g. the loss of a navigational aid required on the route
- landing gear damage, e.g., a tire failure.

Specific procedures and precautions for each aircraft type are contained in the respective FCOM and shall be consulted prior to an overweight landing.

196. With the two-engine aircraft, what is the procedure in case of engine failure en route ?

(OM-A 8.12.1.3)

Procedure in case of Engine Failure En Route
Two-engine Aircraft
Landing shall be made at the nearest suitable airport considering safety only. Any airport where pilots have obtained or can obtain necessary information and considered safe under prevailing circumstances may be used.

If two or more suitable airports are at the same flying time from the present position of the aircraft, the station having a spare engine available should have priority.

197. Prior entering RVSM airspace, which equipment should be operating normally ?

(OM-A 16.5.2.3, RM 1.6.8.4)

Procedures before RVSM airspace entry
If any of the required equipment fails prior to the aircraft entering RVSM airspace, the pilot should request a new clearance so as to avoid flight in this airspace. The following equipment should be operating normally at entry into RVSM airspace:

(a) two serviceable independent primary altitude measurement systems.
(b) one automatic altitude-control system.
(c) one altitude-alerting device.

Note: Single source dependency following ADC failure does not meet the criteria for RVSM operation.
The operator should ascertain the requirement for an operational transponder in each RVSM area where operations are intended.

(LIDO; General Part: NAV)
Flight Crew Operating Procedures

(Extract from ICAO Doc 9574)

In-flight Procedures
Generally, flight crew operating procedures in RVSM airspace are no different from those in any other airspace; however, the continuity of RVSM operations will require periodic review of procedures specific to a region, e.g. contingency procedures, and should be reflected in regional documentation. Given the safety requirements and the effect large height deviations could have on the risk levels, crews should be reminded to exercise vigilance to minimize the occurrence of deviations from the cleared flight level. To this end, during routine training, flight crews should be reminded of the importance of adhering to the following in-flight procedures:

Equipment Required
Before entering RVSM airspace, the pilot should review the status of equipment required. The following equipment should be operating normally:

- two altitude measurement systems, as defined by the RVSM MASPS;
- automatic altitude-keeping device(s);

Note: Redundancy requirements for altitude-keeping devices should be established by regional agreement after an evaluation of such criteria as mean time between failures, length of flight segments and availability of direct pilot controller communications and radar surveillance.

- at least one altitude-reporting transponder (if required for operation in that specific RVSM airspace) capable of being switched to operate from either of the two altimetry systems required by the RVSM MASPS; and
- one altitude-alerting device.

Should any of this equipment fail prior to the ACFT entering RVSM airspace, the pilot should request a new clearance so as to avoid flight in this airspace;

198. If a revised air traffic control clearance cannot be obtained and deviations from track is required to avoid weather, what are the actions required by pilot in a RVSM ?
(OM-A 16.5.2.8.2) (RM 1.6.8.4)

Operation and Contingency Procedures (Weather deviation procedures)

Actions to be Taken if a Revised ATC Clearance Cannot be Obtained

Note: The provisions of this section apply to situations where a pilot needs to exercise the authority of a P-i-C under the provisions of ICAO Annex 2, 2.3.1. If the ACFT is required to deviate from track to avoid adverse meteorological conditions and prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time. Until an ATC clearance is received.

The pilot shall take the following actions:
a) if possible, deviate away from an organized track or route system;
b) establish communications with and alert nearby ACFT by broadcasting, at suitable intervals: ACFT identification, flight level, position (including ATS route designator or the track code) and intentions, on the frequency in use and on 121.500MHZ (or, as a backup, on the inter-pilot air-to-air frequency 123.450MHZ);
b) watch for conflicting traffic both visually and by reference to ACAS (if equipped);

Note: If, as a result of actions taken under provisions of b) and c) above, the pilot determines that there is another ACFT at or near the same flight level with which a conflict may occur, then the pilot is expected to adjust the path of the ACFT, as necessary, to avoid conflict.

d) turn on all ACFT exterior lights (commensurate with appropriate operating limitations);
e) for deviations of less than 10NM (19km) remain at a level assigned by ATC;
f) for deviations greater than 10NM (19km), when the ACFT is approximately 10NM (19km) from track, initiate a level change in accordance with the table below;
g) when returning to track, be at its assigned flight level when the ACFT is within approximately 10NM (19km) of the center line; and
h) if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

Route Center line Track Deviations >10NM (19km) Level Change

Route center line track	Deviations > 10 NM	Level change
EAST 000-179 magnetic	LEFT RIGHT	DESCEND 300 ft CLIMB 300 ft
WEST 180-359 magnetic	LEFT RIGHT	CLIMB 300 ft DESCEND 300 ft

(LIDO; General Part: NAV)

Flight Crew Operating Procedures (Extract from ICAO Doc 9574)

In-flight Procedures

Generally, flight crew operating procedures in RVSM airspace are no different from those in any other airspace; however, the continuity of RVSM operations will require periodic review of procedures specific to a region, e.g. contingency procedures, and should be reflected in regional documentation. Given the safety requirements and the effect large height deviations could have on the risk levels, crews should be reminded to exercise vigilance to minimize the occurrence of deviations from the cleared flight level. To this end, during routine training, flight crews should be reminded of the importance of adhering to the following in-flight procedures:

Contingency Procedures

The following contingency procedures should be adhered to after entering RVSM airspace:

- the pilot should notify ATC of contingencies (equipment failures, weather conditions) in which the ability to maintain CFL is affected and coordinate a plan of action.
- **equipment failures** should be notified to ATC. Some examples are:
  - failure of all automatic altitude-keeping devices on board the ACFT;
  - loss of redundancy of altimetry systems, or any part of these, on board the ACFT;
  - failure of all altitude-reporting transponders;
  - loss of thrust on an engine necessitating descent; and
  - any other equipment failure affecting the ability to maintain CFL;
- the pilot should notify ATC when encountering severe turbulence; and
- if unable to notify ATC and obtain an ATC clearance prior to deviating from the assigned CFL, the pilot should follow established contingency procedures as defined by the region of operation and obtain ATC clearance as soon as possible.

For special procedures for in-flight contingencies in oceanic airspace, refer to:
RAR 1.5.2.17.4 Special Procedures for In-Flight Contingencies in Oceanic Airspace (ICAO DOC4444)

199. When changing flight levels, what is the maximum distance you are allowed to overshoot or undershoot ? (OM-A 16.5.2.4), (RM 1.6.8.4)

In-flight procedures

(a) Flight crews should comply with aircraft operating restrictions (if required for the specific aircraft group) related to RVSM airworthiness approval.

(b) Place emphasis on promptly setting the sub-scale on all primary and standby altimeters to 29.92 in.Hg/1013.2 (hPa) when passing the transition altitude and rechecking for proper altimeter setting when reaching the initial cleared flight level (CFL).

(c) In level cruise, it is essential that the aircraft is flown at the CFL. This requires that particular care is taken to ensure that ATC clearances are fully understood and followed. Except in contingency or emergency situations, the aircraft should not intentionally depart from CFL without a positive clearance from ATC.

(d) During cleared transition between levels, the aircraft should not be allowed to overshoot or undershoot the CFL by more than 150 ft (45 m).

Note: It is recommended that the level off be accomplished using the altitude capture feature of the automatic altitude-control system, if installed. High rates of climb or descent may result in nuisance TCAS alerts on older TCAS equipment (TCAS 7.0) when in vicinity of other traffic or in areas of high traffic density. For this reason it may be advisable to reduce the rate of climb/descent to less than 1,000 ft/min within 1,000 ft of the cleared flight level.

(e) An automatic altitude-control system should be operative and engaged during level cruise, except when circumstances such as the need to re-trim the aircraft or turbulence require disengagement. In any event, adherence to cruise altitude should be done by reference to one of the two primary altimeters.

(f) The altitude-alerting system should be operational.

(g) At intervals of approximately one hour, make cross-checks between the primary altimeters and the stand-by altimeter. A minimum of two primary altimeters should agree within 200 ft (60 m) or a lesser value if specified in the aircraft operating manual. (Failure to meet this condition will require that the altimetry system be reported as defective and notified to ATC). Note the difference between the primary and stand-by altimeters for use in contingency situations.

(1) The normal pilot scan of cockpit instruments should suffice for altimeter crosschecking on most flights.

(2) When operating under positive radar control, the initial altimeter cross-check should be performed after level off. On Class II navigation legs, a cross-check should be performed and recorded in the vicinity of the point where Class II navigation is begun (for example: on coast out). The readings of the primary and standby altimeters should be recorded and available for use in contingency situations.

(3) Some aircraft have automatic comparators that compare the two primary altimetry systems. The comparators include a monitoring, warning, and fault function. The faults may be recorded automatically by the system but a record of the differences in the primary altimetry systems may not be easily derived.

Note: Future systems may make use of automatic altimeter comparators in lieu of cross-checks by the crew.

(h) Crew should ensure the autopilot used and the transponder selected use the same air data source for altitude information.

(i) If ATC notifies the pilot of an AAD error that equals or exceeds 300 ft (90 m) then the pilot should take action to return to CFL as quickly as possible.

(j) Contingency procedures after entering RVSM airspace. The pilot should notify ATC of contingencies (aircraft system failures, weather conditions) which affect the ability to maintain the CFL and coordinate a plan of action.

(LIDO; General Part: NAV)

Flight Crew Operating Procedures (Extract from ICAO Doc 9574)

In-flight Procedures

Generally, flight crew operating procedures in RVSM airspace are no different from those in any other airspace; however, the continuity of RVSM operations will require periodic review of procedures specific to a region, e.g. contingency procedures, and should be reflected in regional documentation. Given the safety requirements and the effect large height deviations could have on the risk levels, crews should be reminded to exercise vigilance to minimize the occurrence of deviations from the cleared flight level. To this end, during routine training, flight crews should be reminded of the importance of adhering to the following in-flight procedures:

b) during cleared transition between levels, the ACFT should not be allowed to overshoot or undershoot the new flight level by more than 150ft (45m);

Note: The transition should be accomplished using the altitude capture feature of the automatic altitude-keeping device, if installed.

200. In RVSM airspace, why do we need to note the difference between the primary and standby altimeters ?

(OM-A 16.5.2.4), (RM 1.6.8.4)

In-flight procedures

(a) Flight crews should comply with aircraft operating restrictions (if required for the specific aircraft group) related to RVSM airworthiness approval.

(b) Place emphasis on promptly setting the sub-scale on all primary and standby altimeters to 29.92 in.Hg/1013.2 (hPa) when passing the transition altitude and rechecking for proper altimeter setting when reaching the initial cleared flight level (CFL).

(c) In level cruise, it is essential that the aircraft is flown at the CFL. This requires that particular care is taken to ensure that ATC clearances are fully understood and followed. Except in contingency or emergency situations, the aircraft should not intentionally depart from CFL without a positive clearance from ATC.

(d) During cleared transition between levels, the aircraft should not be allowed to overshoot or undershoot the CFL by more than 150 ft (45 m).

Note : It is recommended that the level off be accomplished using the altitude capture feature of the automatic altitude-control system, if installed. High rates of climb or descent may result in nuisance TCAS alerts on older TCAS equipment (TCAS 7.0) when in vicinity of other traffic or in areas of high traffic density. For this reason it may be advisable to

reduce the rate of climb/descent to less than 1,000 ft/min within 1,000 ft of the cleared flight level.

(e) An automatic altitude-control system should be operative and engaged during level cruise, except when circumstances such as the need to re -trim the aircraft or turbulence require disengagement. In any event, adherence to cruise altitude should be done by reference to one of the two primary altimeters.

(f) The altitude-alerting system should be operational.

(g) At intervals of approximately one hour, make cross-checks between the primary altimeters and the stand-by altimeter. A minimum of two primary altimeters should agree within 200 ft (60 m) or a lesser value if specified in the aircraft operating manual. (Failure to meet this condition will require that the altimetry system be reported as defective and notified to ATC). Note the difference between the primary and stand-by altimeters for use in contingency situations.

(1) The normal pilot scan of cockpit instruments should suffice for altimeter crosschecking on most flights.

(2) When operating under positive radar control, the initial altimeter cross-check should be performed after level off. On Class II navigation legs, a cross-check should be performed and recorded in the vicinity of the point where Class II navigation is begun (for example: on coast out). The readings of the primary and standby altimeters should be recorded and available for use in contingency situations.

(3) Some aircraft have automatic comparators that compare the two primary altimetry systems. The comparators include a monitoring, warning, and fault function. The faults may be recorded automatically by the system but a record of the differences in the primary altimetry systems may not be easily derived.

Note : Future systems may make use of automatic altimeter comparators in lieu of cross-checks by the crew.

(h) Crew should ensure the autopilot used and the transponder selected use the same air data source for altitude information.

(i) If ATC notifies the pilot of an AAD error that equals or exceeds 300 ft (90 m) then the pilot should take action to return to CFL as quickly as possible.

(j) Contingency procedures after entering RVSM airspace. The pilot should notify ATC of contingencies (aircraft system failures, weather conditions) which affect the ability to maintain the CFL and coordinate a plan of action.

(LIDO; General Part: NAV)

Flight Crew Operating Procedures (Extract from ICAO Doc 9574)

In-flight Procedures

Generally, flight crew operating procedures in RVSM airspace are no different from those in any other airspace; however, the continuity of RVSM operations will require periodic review of procedures specific to a region, e.g. contingency procedures, and should be reflected in regional documentation. Given the safety requirements and the effect large height deviations could have on the risk levels, crews should be reminded to exercise vigilance to minimize the occurrence of deviations from the cleared flight level. To this end, during routine training, flight crews should be reminded of the importance of adhering to the following in-flight procedures:

e) regular (hourly) cross-checks between the altimeters should be made, and a minimum of two RVSM MASPS-compliant systems must agree within 200ft (60m). Failure to meet this condition will require that the system be reported as defective and notified to ATC;

201. How should pilot initiate communications with ATC in order to obtain rapid response for weather avoidance in RVSM airspace ?
(OM-A 16.5.2.8), (RM 1.5.2.17.4.2)

Weather deviation procedures
General
The following procedures are intended for deviations around adverse meteorological conditions. When the pilot initiates communications with ATC, a rapid response may be obtained by stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency for ATC response. When necessary, the pilot should initiate the communications using the urgency call "PAN PAN" (preferably spoken three times).

The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the ACFT has returned to its cleared route.

(LIDO; General Part: RAR)
Weather Deviation Procedures
General
The following procedures are intended for deviations around adverse meteorological conditions. When weather deviation is required, the pilot should initiate communication with ATC via voice or CPDLC. A rapid response may be obtained by either:

a) stating “WEATHER DEVIATION REQUIRED” to indicate that priority is desired on the frequency and for ATC response; or
b) requesting a weather deviation using a CPDLC lateral downlink message.
When necessary, the pilot should initiate the communications using the urgency call “PAN PAN” (preferably spoken three times) or by using a CPDLC urgency downlink message.

The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to its cleared route.

202. In Asia/Pacific RVSM airspace, an aircraft encounters wake vortex turbulence but clearance for a flight level, track or speed change is not possible, what should pilot do?
(OM-A 16.5.2.9), (RM 1.5.2.12.3)

Special procedures to mitigate wake turbulence encounters and distracting aircraft system alerts in oceanic and non-radar airspace

a) The following special procedures are applicable to mitigate wake turbulence or distracting aircraft system alerts (e.g., ACAS, Ground Proximity Warning System (GPWS)) in Asia and Pacific airspace where RVSM is applied:
b) in the contingency circumstances below, ATC will not issue clearances for lateral offsets and will not normally respond to actions taken by the pilots.
c) An aircraft that encounters wake vortex turbulence or experiences distracting aircraft system alerts shall notify ATC and request a flight level, track or speed change to avoid the condition.

However, in situations where such a change is not possible or practicable, the pilot may initiate the following temporary lateral offset procedure with the intention of returning to centerline as soon as practicable:

1. the pilot should establish contact with other aircraft, if possible, on the appropriate VHF inter-pilot air to air frequency; and
2. one (or both) aircraft may initiate lateral offset(s) not to exceed 2 NM from the assigned track, provided that:
   i) as soon as practicable to do so, the offsetting aircraft notify ATC that temporary lateral offset action has been taken and specify the reason for doing so (ATC will not normally respond); and
   ii) the offsetting aircraft notify ATC when re-established on assigned route(s) or track(s) (ATC will not normally respond).

(LIDO; General Part: RAR)

Strategic Lateral Offset Procedures (SLOP)

SLOP are approved procedures that allow aircraft to fly on a parallel track to the right of the centerline relative to the direction of flight to mitigate the lateral overlap probability due to increased navigation accuracy and wake turbulence encounters. Unless specified in the separation standard, an aircraft's use of these procedures does not affect the application of prescribed separation standards.

ICAO Annex 2 requires authorization for the application of SLOP from the appropriate ATS authority responsible for the airspace concerned.

The routes or airspace where application of strategic lateral offsets is authorized, and the procedures to be followed by pilots, shall be promulgated in the AIPs. In some instances, it may be necessary to impose restrictions on the use of strategic lateral offsets, e.g. where their application may be inappropriate for reasons related to obstacle clearance. Route conformance monitoring systems shall account for the application of SLOP.

Where such authorizations and procedures have been published by the respective State, they are mentioned in the respective RSIs and/or CRARs of the Lido Route Manual.
Strategic lateral offsets shall be authorized only in en-route airspace as follows:

- where the lateral separation minima or spacing between route centerlines is 15NM (28km) or more, offsets to the right of the centerline relative to the direction of flight in tenths of a nautical mile up to a maximum of 2NM (3.7km); and
- where the lateral separation minima or spacing between route centre lines is 10NM (19km) or more and less than 15NM (28km), while one aircraft climbs/descends through the level of another aircraft, offsets to the right of the centre line relative to the direction of flight in tenths of a nautical mile up to a maximum of 2NM (3.7km); and
- where the lateral separation minima or spacing between route centerlines is 6NM (11.1km) or more and less than 15NM (28km), offsets to the right of the centerline relative to the direction of flight in tenths of a nautical mile up to a maximum of 0.5NM (0.9km).

The decision to apply a strategic lateral offset shall be the responsibility of the flight crew. The flight crew shall only apply strategic lateral offsets in airspace where such offsets have been authorized

by the appropriate ATS authority and when the aircraft is equipped with automatic offset tracking capability.

Note 1:	Pilots may contact other aircraft on the inter-pilot air-to-air frequency 123.450 to coordinate offsets.
Note 2:	The SLOP has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, an offset to the right and within the limits specified above may be used.
Note 3:	Pilots are not required to inform ATC that a strategic lateral offset is being applied.

203. Discuss about the Right of Way.

(OM-A 12.13), (RM 1.5.2.6.2.3)

Right of Way

Aircraft that has right of way shall maintain its heading and speed, but nothing in these rules shall relieve the pilot's responsibility of taking such action as it will best avert collision. The aircraft obliged to keep out of the way of another shall avoid passing over or under or crossing ahead of it unless the passing is well cleared.

Two aircraft approaching head on or approximately so, shall alter their headings to the right. When two aircraft are converging at approximately the same altitude, the aircraft with the other on its right shall give way, except:

- power-driven heavier-than-air aircraft shall give way to airships, gliders and balloons
- power-driven aircraft shall give way to aircraft which is seen to be towing another aircraft or object.

The aircraft being overtaken has the right of way. The overtaking aircraft, whether climbing, descending or in horizontal flight, shall keep out of way by altering its heading to the right. No change in the relative positions shall absolve the overtaking aircraft from this obligation until it entirely passes and is cleared.

The overtaking aircraft is the aircraft approaching another aircraft from the rear at an angle of less than 70°.

The aircraft in flight or operating on ground shall give way to the aircraft landing or on final approach.

When two or more aircraft are approaching an aerodrome, the aircraft at higher altitude shall give way to the aircraft at lower altitude, but the latter shall not take advantage of this rule to cut-in in front of the aircraft on final approach, or to overtake it. Power-driven aircraft shall give way to gliders. An aircraft becoming aware that another aircraft is compelled to land shall give way to that aircraft.

(LIDO; General Part: RAR)

Right-of-Way

The aircraft that has the right-of-way shall maintain its heading and speed.

An aircraft that is obliged by the following rules to keep out of the way of another shall avoid passing over, under or in front of the other, unless it passes well clear and takes into account the effect of aircraft wake turbulence.

Approaching Head-on
When two aircraft are approaching head-on or approximately so and there is danger of collision, each shall alter its heading to the right.

Converging
When two aircraft are converging at approximately the same level, the aircraft that has the other on its right shall give way, except as follows:
a) power-driven heavier-than-air aircraft shall give way to airships, gliders and balloons;
b) airships shall give way to gliders and balloons;
c) gliders shall give way to balloons;
d) power-driven aircraft shall give way to aircraft which are seen to be towing other aircraft or objects.

Overtaking
An overtaking aircraft is an aircraft that approaches another from the rear on a line forming an angle of less than 70 degrees with the plane of symmetry of the latter, i.e. is in such a position with reference to the other aircraft that at night it should be unable to see either of the aircraft's left (port) or right (starboard) navigation lights. An aircraft that is being overtaken has the right-of-way and the overtaking aircraft, whether climbing, descending or in horizontal flight, shall keep out of the way of the other aircraft by altering its heading to the right, and no subsequent change in the relative positions of the two aircraft shall absolve the overtaking aircraft from this obligation until it is entirely past and clear.

Landing
An aircraft in flight, or operating on the ground or water, shall give way to aircraft landing or in the final stages of an approach to land.
When two or more heavier-than-air aircraft are approaching an aerodrome for the purpose of landing, aircraft at the higher level shall give way to aircraft at the lower level, but the latter shall not take advantage of this rule to cut in in front of another which is in the final stages of an approach to land, or to overtake that aircraft. Nevertheless, power-driven heavier-than-air aircraft shall give way to gliders.

Emergency Landing
An aircraft that is aware that another is compelled to land shall give way to that aircraft.

Taking Off
An aircraft taxiing on the manoeuvring area of an aerodrome shall give way to aircraft taking off or about to take off.

Surface Movement of Aircraft
In case of danger of collision between two aircraft taxiing on the movement area of an aerodrome the following shall apply:
a) when two aircraft are approaching head on, or approximately so, each shall stop or where practicable alter its course to the right so as to keep well clear;
b) when two aircraft are on a converging course, the one which has the other on its right shall give way;
c) an aircraft which is being overtaken by another aircraft shall have the right-of-way and the overtaking aircraft shall keep well clear of the other aircraft.

An aircraft taxiing on the manoeuvring area shall stop and hold at all runway-holding positions unless otherwise authorized by the aerodrome control tower.
An aircraft taxiing on the manoeuvring area shall stop and hold at all lighted stop bars and may proceed further when the lights are switched off.

204. What is the procedures of Pre-Flight Security Check ?

(OM-A 10.3.2.2)

Pre-flight Security Check Procedure

In cabin compartment, the cabin crew must adhere to the following procedures strictly:

- the cabin pre-flight security check shall be performed after all ground personnel have completed their duties and services in the cabin and already left the aircraft, approximately 10 minutes before passenger boarding
- CIC will initiate cabin security check by:
  – informing the P-i-C that the check will start
  – instructing the assigned cabin crew to guard the opened door until such door is closed for departure
  – ensure that the pre-flight security checklist is strictly followed
  – checking that no ground staff/personnel remaining aboard
- in case of any ground staff/personnel is required to remain aboard or needed to enter into the aircraft during pre-flight security check:
  – CIC must inform the P-i-C of the number of ground staff/personnel and reasons to remain aboard
  – record his/her name and duty in the "Access Control Record" form
- announcing to all cabin crew members to perform the check
- if any suspicious item is found in the cabin, cabin crew shall:
  – not touch or move the item
  – note position of the object
  – advise other crew members to stand away from the immediate vicinity
  – inform CIC to report P-i-C
- whenever the cabin security check has been completed, CIC shall report to the P-i-C and ask permission for passenger boarding
- after cabin pre-flight security check, if any ground staff/personnel need to board the aircraft, the crew guarding the door must:
  – inquire the nature of duty
  – check items carried aboard
  – record his/her name and duty in the "Access Control Record" form (Identified by responsible crew); if unable to comply, crew shall collect his/her ID card or a copy of ID card
  – complete the "Access Control Record" or return his/her ID card when such ground staff/ personnel have completed the duty on board
- before closing cabin door, the crew assigned to the door shall make sure that no ground staff/ personnel remains aboard. If there is any name on the Access Control Record form or ID card remaining, which indicates that there is ground staff/personnel remaining aboard, CIC and the P-i-C must use appropriate means to identify the person before departure.

205. What is the procedures of Post-Flight Security Check ?

(OM-A 10.3.3)

Post-flight Security Check

In order to assure that the cabin is cleared from any foreign items and passenger belongings being left aboard, cabin crew shall perform post-flight security check by making a visual inspection for any items probably being left behind as stated in the following procedure.
Upon the completion of post-flight security check, cabin crew shall inform CIC.

Post-flight security check of a cabin by visual inspection must include:

- overhead bins and side stowage
- passengers seats
- coat lockers
- crew rest area
- lavatories.

To initiate post-flight security check, the following procedure should be performed:

- cabin crew may perform the following post-flight security check behind the passenger track to look for any left behind items or foreign objects left aboard:
  – the checking process should start from available section till the end section on both sides for time management
  – ground personnel should be allowed to board after post-flight security check is completed unless deemed necessary
- in case any item is found in cabin, cabin crew shall: - Determine if it is passenger left behind, otherwise:
  – do not touch or move the item
  – note position of the object
  – advise other crew members to stand away from the immediate vicinity
  – inform CIC to report P-i-C
- cabin crew shall report by PA when post-flight security check is completed after receiving order from CIC
- CIC informs the P-i-C after completion of post-flight security check.

206. What are the purpose of SATVOICE communication ?

(OM-A 8.13.1.3)

Satellite Voice Communication (SATVOICE)

Satellite voice communication provided for aeronautical services is a private telephone circuit. The normal paths of communication are as follows:

- aircraft to INMARSAT (Space segment)
- INMARSAT to Ground Earth Station (LOG-ON facility) and
- Ground Earth Station connection with public telephone system to facility.

The average call-set-up time from selecting PLACE CALL to connection is about 22 sec. This is dependent on ground networks being available and normal priorities of operation through the Ground Earth Station. The communication system is duplex, where both parties can speak

simultaneously without interference. To maintain common operating procedures with VHF and HF radio telephone circuits, the SATVOICE system utilizes the normal push-to-talk (PTT) switches through the aircraft audio control panel.

Procedure
SATVOICE communication is available for non-routine or irregular procedures requiring technical discussions or non-standard operating procedures with dispatch and station in operations.

Use of SATVOICE with Air Traffic Control is recommended when emergency, non-routine or irregular conditions, in the opinion of the flight crew, can only be solved through direct voice communications. It is recommended to initiate the alert via datalink of impending problems and then revert to SATVOICE for follow-up procedures.

207. What is THAI policy about firearms and bodyguards ?

(OM-A 9.16), (OM-A 10.4)

Conditions under Which Weapons, Munitions of War and Sporting Weapons may be Carried Policy
THAI will not transport weapons of war and munitions of war.

In normal practice, carriage of firearms, weapons and ammunition either as cabin baggage or checked baggage by flight operated with TG number or aircraft under THAI operational responsibility is prohibited.

Firearms, weapons and ammunition may only be accepted for transportation according to the procedures outlined in para 2 below with granted approval. Any local regulations must be complied with, including the State of the Operator and State(s) of flight departure, transit/transfer and destination.

For more details, refer to SPM 5.4—Firearms, Other Weapons, Bodyguards and In-Flight Security Officer .

Note: For domestic flight, local airport security regulations regarding handling of restricted items/ ammunition/firearms must be referred for further actions at each airport.

Exception
Exceptions are made to the following categories of transport:

- carriage of firearms and ammunition as checked baggage for sporting purpose
- carriage of firearms and ammunition into aircraft cabin by a Law Enforcement Officer (LEO) acting as a bodyguard and In-flight Security Officer
- carriage of firearms and ammunition as checked baggage other than sporting purpose
- carriage of weapons and munitions as cargo.

Carriage of Firearms and Ammunition as Checked Baggage for Sporting Purpose
When passengers make notification for carriage of firearms and ammunition for sporting purpose e.g. attending shooting competition such as a national or world sporting, THAI must ensure that the passengers having legal and administrative authorization to detain or carry such firearms as sporting purpose. For this category, firearms and ammunition shall never be accepted as carry-on in the aircraft's cabin, and as such shall be transported only as checked baggage.

For this category, firearms and ammunition shall never be accepted as carry-on in the aircraft's cabin, and as such shall be transported only as checked baggage.

For more details, refer to SPM 5.4—Firearms, Other Weapons, Bodyguards and In-Flight Security Officer .

OM-A 10.4

Carriage of Weapons Aboard of the Aircraft

Given the risks associated with the carriage of firearms aboard THAI aircraft, no firearms are permitted in possession of any passenger aboard.

Only under the conditions described hereafter, the carriage of weapons is permitted to certain categories of persons:

- private persons with special authorizations from the competent relevant authority
- armed bodyguards and law enforcement officers with special authorizations from the competent relevant authority
- in-flight security officers (if applicable).

For all detailed procedures, please refer to SPM 5.4—Firearms, Other Weapons, Bodyguards and In-flight Security Officer.

208. Regarding the operation of transponders, what should be set in case of a hijacking, communication failure and emergency procedure ?

(RM COM 1.7.8.1.1)

Special Purposes Transponder Codes

The following Mode A codes shall be reserved for special purposes:

Transponder Code	Meaning
7700	to provide recognition of an aircraft in an emergency.
7600	to provide recognition of an aircraft with radio communication failure.
7500	to provide recognition of an aircraft which is being subjected to unlawful interference
2000	to provide recognition of an aircraft which has not received any instructions from air traffic control units.

209. What is the definitions of Accident ? (RM 1.9.2)

Accident

An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

a) a person is fatally or seriously injured as a result of:

- being in the aircraft, or

- direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
- direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which:
- adversely affects the structural strength, performance or flight characteristics of the aircraft, and
- would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or

c) the aircraft is missing or is completely inaccessible.

Note 1: For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.

Note 2: An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

Serious Injury (1.9.2.17. S)

An injury which is sustained by a person in an accident and which:
a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
c) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or
d) involves injury to any internal organ; or
e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or
f) involves verified exposure to infectious substances or injurious radiation.

210. What is the definitions of Incident ?

(RM 1.9.2), (Annex13 Aircraft Accident and Incident Investigation)

Definition
Incident (1.9.2.9. I)

An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Serious Incident (1.9.2.17. S)

An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down.

Note: The difference between an accident and a serious incident lies only in the result.

(Annex13 Aircraft Accident and Incident Investigation)

ATTACHMENT C. LIST OF EXAMPLES OF SERIOUS INCIDENTS

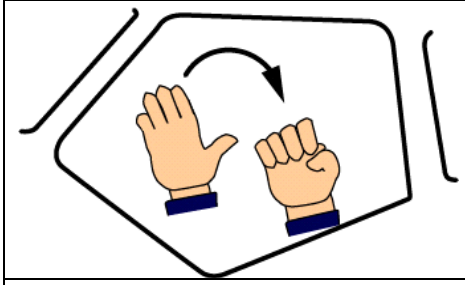
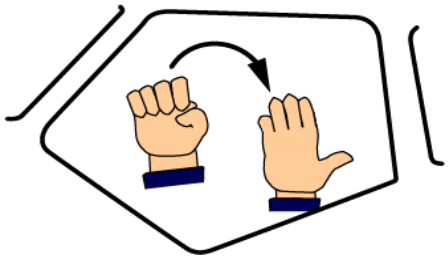
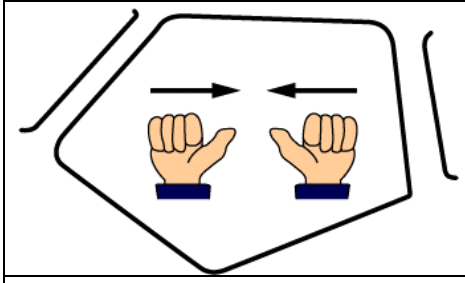
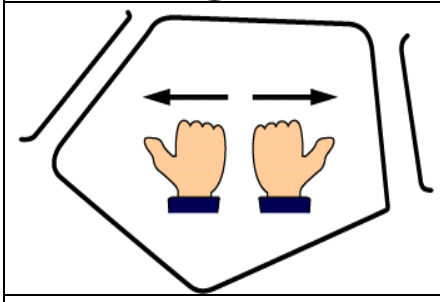
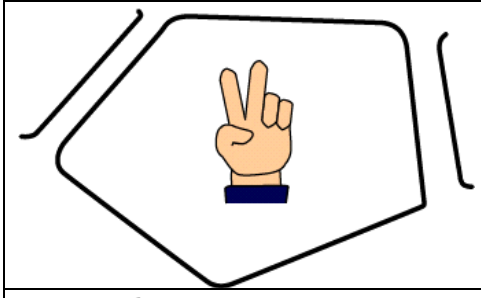
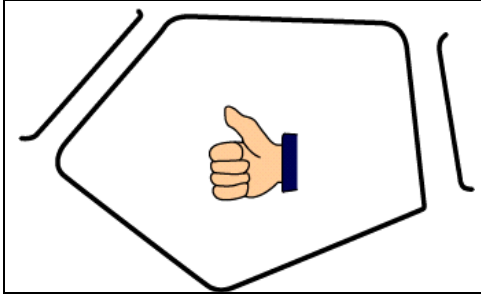
1. The term "serious incident" is defined in Chapter 1 as follows:
   Serious incident. An incident involving circumstances indicating that an accident nearly occurred.
2. The incidents listed are typical examples of incidents that are likely to be serious incidents. The list is not exhaustive and only serves as guidance to the definition of serious incident.
   - Near collisions requiring an avoidance manoeuver to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.
   - Controlled flight into terrain only marginally avoided.
   - Aborted take-offs on a closed or engaged runway.
   - Take-offs from a closed or engaged runway with marginal separation from obstacle(s).
   - Landings or attempted landings on a closed or engaged runway
   - Gross failures to achieve predicted performance during take-off or initial climb. Fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.
   - Events requiring the emergency use of oxygen by the flight crew.
   - Aircraft structural failures or engine disintegrations not classified as an accident.
   - Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.
   - Flight crew incapacitation in flight.
   - Fuel quantity requiring the declaration of an emergency by the pilot.
   - Take-off or landing incidents. Incidents such as under-shooting, overrunning or running off the side of runways.
   - System failures, weather phenomena, operations outside the approved flight envelope or other occurrences which could have caused difficulties controlling the aircraft.
   - Failures of more than one system in a redundancy system mandatory for flight guidance and navigation.

211. What are marshaling signals from pilot to signalman ? (RM 1.3.2.3.2)

Pilot to Signalman

These signals are designed for use by a pilot in the cockpit with hands plainly visible to the signalman, and illuminated as necessary to facilitate observation by the signalman.

The aircraft engines are numbered in relation to the signalman facing the aircraft from right to left (i.e. No. 1 engine being the port outer engine).

Marshalling Signals Pilot to Signalman	
	**Brakes Engaged** Raised arm and hand, with fingers extended, horizontally in front of face. Hand is then closed to a fist
	**Brakes Released** Raised arm, with fist clenched, horizontally in front of face. Hand is then opened to an open palm.
	**Insert Wheel Chocks** Arms extended, palms outwards, and hands moving inwards.
	**Remove Wheel Chocks** Hands crossed in front of face, palms inwards, and arms moving outwards.
	**Ready to Start Engine(s)** One hand raised with the appropriate number of fingers stretched indicating the number of the engine to be started.
	**All Clear** Acknowledgement of all ground actions.

212. How can runway stripes indicated the runway width ?

(RM 1.3.2.5.5)

RWY Designator Markings

The numbers of stripes are in accordance with the RWY width:

Runway width	Number of stripes
18m / 60ft	4
23m / 75ft	6
30m / 100ft	8
45m / 150ft	12
60m / 200ft	16

213. When shall indication of heavy wake turbulence be transmitted ?

(RM 1.7.3.7)

Indication of Wake Turbulence Category

Wake Turbulence Category "HEAVY"

For ACFT in the heavy WTC the word "HEAVY" shall be included immediately after the ACFT call-sign in the initial radiotelephony contact between such ACFT and ATS units.

Example: "LUFTHANSA FOUR ZERO ZERO HEAVY"

Wake Turbulence Category "SUPER"

For A388 and A225 ACFT the expression "SUPER" should be included immediately after the ACFT call-sign in the initial radiotelephony contact between such ACFT and ATS units.

Example: "EMIRATES EIGHT EIGHT PAPA SUPER"

Note: Wake Turbulence Group A is equivalent to the SUPER wake turbulence category, and Groups B and C are equivalent to the HEAVY category.

214. How do we transmit the number in Radiotelephony? (RM 1.7.1.2.2)

Transmission of Numbers

- All numbers, except as prescribed in PARAs b) to f) shall be transmitted by pronouncing each digit separately.

Examples	Transmitted as
Aircraft Call Sign	
AFR 238	Air France **two three eight**
DLH 242	Lufthansa **two four two**
Headings	
100 degrees	heading **one zero zero**
080 degrees	heading **zero eight zero**
Wind Direction and Speed	
200 degrees 70 knots	wind **two zero zero** degrees seven zero knots
160 degrees 18 knots gusting 30 knots	wind **one six zero** degrees **one eight** knots gusting **three zero** knots

Runway	
27	runway **two seven**
30	runway **three zero**

b) Flight levels shall be transmitted by pronouncing each digit separately except for the case of flight levels in whole hundreds, which shall be transmitted by pronouncing the digit of the whole hundred followed by the word HUNDRED.

Examples	Transmitted as
Flight Levels	
FL180	flight level **one eight zero**
FL200	flight level **two hundred**

c) The altimeter setting shall be transmitted by pronouncing each digit separately except for the case of a setting of 1 000 hPa which shall be transmitted as ONE THOUSAND.

Examples	Transmitted as
Altimeter Setting	
1009	QNH **one zero zero nine**
1000	QNH **one thousand**
993	QNH **nine nine three**

d) All numbers used in the transmission of transponder codes shall be transmitted by pronouncing each digit separately except that, when the transponder codes contain whole thousands only, the information shall be transmitted by pronouncing the digit in the number of thousands followed by the word THOUSAND.

Examples	Transmitted as
Transponder Codes	
2400	Squawk **two four zero zero**
1000	Squawk **one thousand**
2000	Squawk **two thousand**

e) All numbers used in the transmission of altitude, cloud height, visibility and RVR information, which contain whole hundreds and whole thousands, shall be transmitted by pronouncing each digit in the number of hundreds or thousands followed by the word HUNDRED or THOUSAND as appropriate. Combinations of thousands and whole hundreds shall be transmitted by pronouncing each digit in the number of thousands followed by the word THOUSAND followed by the number of hundreds followed by the word HUNDRED.

Examples	Transmitted as
Altitude	
800	eight hundred
3400	three thousand four hundred
12000	one two thousand

Cloud Height	
2200	two thousand two hundred
4300	four thousand three hundred
Visibility	
1000	visibility one thousand
700	visibility seven hundred
Runway Visual Range	
600	RVR six hundred
1700	RVR one thousand seven hundred

f) When providing information regarding relative bearing to an object or to conflicting traffic in terms of the 12-hour clock, the information shall be given pronouncing the double digits as TEN, ELEVEN, or TWELVE [O'CLOCK].

g) Numbers containing a decimal point shall be transmitted as prescribed in a) with the decimal point in appropriate sequence being indicated by the word DECIMAL.

Examples	Transmitted as
100.3	ONE ZERO ZERO DECIMAL THREE
38143.9	THREE EIGHT ONE FOUR THREE DECIMAL NINE

h) When transmitting time, only the minutes of the hour should normally be required. Each digit should be pronounced separately. However, the hour should be included when any possibility of confusion is likely to result.

Time	Statement
0920 (9:20 A.M.)	TOO ZE-RO or ZE-RO NIN-er TOO ZE-RO
1643 (4:43 P.M.)	FOW-er TREE or WUN SIX FOW-er TREE

215. State the RNAV phraseology.

(RM 2.1.5.2.1)

RNAV Phraseology

Circumstances	Phraseologies
RNAV arrival or departure procedure cannot be accepted by the pilot	UNABLE [designator] DEPARTURE (or ARRIVAL) DUE RNAV TYPE
Pilot is unable to comply with an assigned terminal area procedure	UNABLE [designator] DEPARTURE (or ARRIVAL) [reasons]
ATC unable to assign an RNAV arrival or departure procedure requested by a pilot due to the type of on-board RNAV equipment	UNABLE TO ISSUE [designator] DEPARTURE (or ARRIVAL) DUE RNAV TYPE
ATC unable to assign an arrival or departure procedure requested by the pilot	UNABLE TO ISSUE [designator] DEPARTURE (or ARRIVAL) [reasons]

Confirmation whether a specific RNAV arrival or departure procedure can be accepted	ADVISE IF ABLE [designator] DEPARTURE (or ARRIVAL)
Informing ATC of RNAV degradation or failure	[aircraft call-sign], UNABLE RNAV DUE EQUIPMENT
Informing ATC of no RNAV capability	[aircraft call-sign], NEGATIVE RNAV

216. What is the correct phraseology by pilot after modifying vertical speed to comply with an ACAS resolution advisory ?

(RM 1.7.3.2.1)

ACAS/TCAS Phaseologies

Circumstances	Pilot	ATC	Phaseologies
... after a flight crew starts to deviate from any ATC clearance or instruction to comply with an ACAS resolution advisory (RA) (Pilot and controller interchange)	x		TCAS RA;
		x	ROGER;
... after the response to an ACAS RA is completed and a return to the ATC clearance or instruction is initiated (Pilot and controller interchange)	x		CLEAR OF CONFLICT, RETURNING TO (assigned clearance):
		x	ROGER (or alternative instructions);
… after the response to an ACAS RA is completed and the assigned ATC clearance or instruction has been resumed (Pilot and controller interchange)	x		CLEAR OF CONFLICT (assigned clearance) RESUMED;
		x	ROGER (or alternative instructions);
… after an ATC clearance or instruction contradictory to the ACAS RA is received, the flight crew will follow the RA and inform ATC directly (Pilot and controller interchange)	x		UNABLE, TCAS RA
		x	ROGER;

217. What is the Minimum Enroute Altitude, Minimum Grid ALTITUDE (MGA) and Minimum Terrain Clearance Altitude (MTCA) ?

(RM 1.5.2.11.1.5, 1.5.2.11.1.7, 1.5.2.11.1.12)

Minimum En-route Altitude (MEA)

The altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance.

Note: The officially published MEA in Lido charts is valid for the whole route segment between two fixes. Plan climb/descent between segments as required in advance.

Minimum Grid Altitude (MGA)

The MGA represents the lowest safe altitude which can be flown off-track. The MGA is calculated by rounding up the elevation of the highest obstruction within the respective grid area to the next 100ft and adding an increment of

1000ft for terrain or obstructions up to 6000ft; or
2000ft for terrain or obstructions above 6000ft.

Example: ELEV of highest obstruction: 6345ft; rounded up = 6400ft + 2000ft buffer = 8400ft MGA

MGA is shown in hundreds of feet. The lowest indicated MGA is 2000ft. This value is also provided for terrain and obstacles that would result in an MGA below 2000ft. An exception is over water areas where the MGA can be omitted.

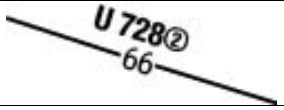
Minimum Terrain Clearance Altitude (MTCA)
MTCA represents an altitude providing terrain and obstacle clearance for all ATS routes, all STAR (up to IAF or equivalent end point) and for selected airports on SID segments. The MTCA is calculated by Lido and covers terrain and obstacle clearance relevant for air navigation with the following buffers:

SID and STAR	5NM horizontally either side of centerline
ATS Routes	10NM horizontally either side of centerline
Vertically	1000ft up to 6000ft
	2000ft above 6000ft

218. How do you know type of RNAV AWY/ATS route with RNP value ?

(RM 1.8.5.5)

RFC / En route Legend

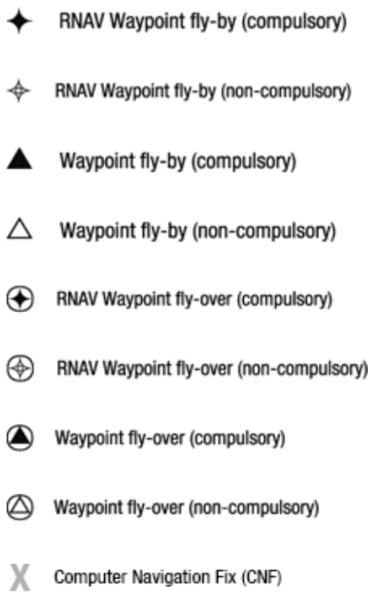
RNAV Airway/ATS Route	
RNAV/RNP Airway/ATS Route with NAV accuracy value 2 in this example	

219. Can you explain RNAV waypoint symbols ? (RM 1.8.3.1)

RM 1.8.3.1 Plan View

Waypoint Symbols

- RNAV: Whenever a waypoint is defined as RNAV waypoint, even for combined conventional and RNAV procedures.
- Conventional: Whenever a waypoint is defined exclusively as a conventional waypoint.
- Compulsory: Whenever a waypoint is defined as compulsory for at least one procedure.
- Fly-over: Whenever a waypoint is defined as fly-over for at least one procedure.
- Fly-by: Whenever a waypoint is defined exclusively as a fly-by waypoint.
- Computer Navigation Fix (for FMS-DB coding)



220. What is a trend-type landing forecast ?

(RM 1.4.4)

Landing Forecasts

A landing forecast shall be prepared by the aerodrome meteorological office designated by the meteorological authority concerned as determined by regional air navigation agreement; such forecasts are intended to meet the requirements of local users and of aircraft within about one hour's flying time from the aerodrome.

Landing forecasts shall be prepared in the form of a trend forecast.

A trend forecast shall consist of a concise statement of the expected significant changes in the meteorological conditions at that aerodrome to be appended to a local routine report, local special report, METAR or SPECI. The period of validity of a trend forecast shall be 2 hours from the time of the report which forms part of the landing forecast.

221. Explain the following abbreviations ? (ICAO ANNEX 3, Appendix 5, 2.2.1) (RM 1.4.2 and RM 1.9.2),

CAVOK

When the following conditions occur simultaneously at the time of observation:

a) visibility, 10km or more, and the lowest visibility is not reported;
b) no cloud of operational significance; (no cloud with the height of cloud base below 1500m (5000ft) or below the highest MSA, whichever is greater, or a cumulonimbus cloud or a towering cumulus cloud at any height)
c) no weather of significance to aviation;

information on visibility, runway visual range, present weather and cloud amount, cloud type and height of cloud base shall be replaced in all meteorological reports by the term “CAVOK”.

NOSIG
ICAO ANNEX 3, Appendix 5, 2.2.1
The trend forecast shall indicate significant changes in respect of one or more of the elements: surface wind, visibility, weather and clouds. Only those elements shall be included for which a significant change is expected. However, in the case of significant changes in respect of cloud, all cloud groups, including layers or masses not expected to change, shall be indicated. In the case of a significant change in visibility, the phenomenon causing the reduction of visibility shall also be indicated. When no change is expected to occur, this shall be indicated by the term "NOSIG"

NSC
Nil significant cloud:
a) no cloud of operational significance; (height of cloud base not below 5000ft (1500m) or the highest MSA, whichever is greater, no CB or TCU at any height)
b) CAVOK is not appropriate.

No Significant Clouds	No significant clouds below 5000ft or highest MSA (TAF and TRENDS only).

NSW
The expected end of occurrence of those phenomena shall be indicated by the abbreviation "NSW"

No Significant Weather	No significant weather indicates cessation of weather given in the preceding part of TAF or reported in METAR.

Ceiling

Ceiling	The height above the ground or water of the base of the lowest layer of cloud below 6000m (20000ft) covering more than half the sky.

Tropopause

Tropopause	The tropopause is the upper limit of the troposphere and therefore constitutes the boundary between it and the stratosphere. The "first tropopause" is conventionally defined as the lowest level at which the lapse rate decreases to 2*C/km or less, provided also that the average lapse rate between this level and all higher levels within 2km does not exceed 2*C/km. If the average lapse rate above this "first tropopause" between any level and all higher levels within 1km exceeds 3ºC/km, then a "second tropopause" is defined by the same criterion as the first. This second tropopause may be either within or above the 1km layer.

Vertical visibility

Vertical visibility	The distance one can see upward into a surface based obscuration; or the maximum height from which a pilot in flight can recognize the ground through a surface based obscuration.

Visibility

Visibility	Visibility for aeronautical purposes is the greater of: • the greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognized when observed against a bright background; • the greatest distance at which lights in the vicinity of 1000 candelas can be seen and identified against an unlit background. **Note 1:** The two distances have different values in air of a given extinction coefficient, and the latter b) varies with the background illumination. The former a) is represented by the Meteorological Optical Range (MOR). **Note 2:** The definition applies to the observations of visibility in local routine and special reports, to the observations of prevailing and minimum visibility reported in METAR and SPECI and to the observations of ground visibility.

222. What is an aerodrome forecast (TAF) ? (RM 1.4.4, RM 1.4.4.1)

Forecasts
Aerodrome Forecasts

An aerodrome forecast shall be prepared, in accordance with regional air navigation agreement, by the aerodrome meteorological office designated by the meteorological authority concerned.

An aerodrome forecast shall be issued at a specified time not earlier than one hour prior to the beginning of its validity period and consist of a concise statement of the expected meteorological conditions at an aerodrome for a specified period.

Aerodrome forecasts and amendments thereto shall be issued as TAF and include the following information in the order indicated:

a) identification of the type of forecast;
b) location indicator;
c) time of issue of forecast;
d) identification of a missing forecast, when applicable;
e) date and period of validity of forecast;
f) identification of a cancelled forecast, when applicable;
g) surface wind;
h) visibility;
i) weather;
j) cloud; and
k) expected significant changes to one or more of these elements during the period of validity.

Optional elements shall be included in TAF in accordance with regional air navigation agreement.

Note: The visibility included in TAF refers to the forecast prevailing visibility.

Aerodrome meteorological offices preparing TAF shall keep the forecasts under continuous review and, when necessary, shall issue amendments promptly. The length of the forecast messages and the number of changes indicated in the forecast shall be kept to a minimum.

TAF that cannot be kept under continuous review shall be cancelled.

ICAO Recommendation:

The period of validity of a routine TAF should be not less than 6 hours and not more than 30 hours; the period of validity should be determined by regional air navigation agreement. Routine TAF valid for less than 12 hours should be issued every 3 hours and those valid for 12 to 30 hours should be issued every 6 hours.

When issuing TAF, aerodrome meteorological offices shall ensure that not more than one TAF is valid at an aerodrome at any given time.

RM 1.4.4.1 Criteria Related to TAF

Use of Change and Time Indicators in TAF			
Change or Time Indicator		**Time Period**	**Meaning**
FM		ndndnhnhnmnm	Used to indicate a significant change in most weather elements occurring at ndnd day, nhnh hours and nmnm minutes (UTC), all the elements given before “FM” are to be included following “FM” *(i.e. they are all superseded by those following the abbreviation)
BECMG		nd1nd1nh1nh1/nd2nd2nh2nh2	The change is forecast to commence at nd1nd1 day and nh1nh1 hours (UTC) and be completed by nd2nd2 day and nh2nh2 hours (UTC): only those elements for which a change is forecast are to be given following “BECMG”: the time period nd1nd1nh1nh1/nd1nd1nh2nh2 should normally be less than 2 hours and in any case should not exceed 4 hours
TEMPO		nd1nd1nh1nh1/nd2nd2nh2nh2	temporary fluctuations are forecast to commence at nd1nd1 day and nh1nh1 hours (UTC) and cease by nd2nd2 day and nh2nh2 hours (UTC); only those elements for which fluctuations are forecast are to be given

			following “TEMPO”; temporary fluctuations should not last more than one hour in each instance, and in the aggregate, cover less than half of the period nd1nd1nh1nh1/nd2nd2nh2nh2	
PROBnn	-	nd1nd1nh1nh1/nd2nd2nh2nh2	probability of occurrence (in %) of an alternative value of a forecast element or elements; nn = 30 or nn = 40 only; to be placed after the element(s) concerned	-
	TEMPO	nd1nd1nh1nh1/nd2nd2nh2nh2		Probability of occurrence of temporary fluctuations

223. In oceanic airspace with regards to weather, aircraft performance or malfunction of pressurization, what are the earliest actions of pilots if ATC clearance can not yet be obtained in RVSM airspace ?

(RM 1.5.2.17.4.2)

Weather Deviation Procedures

General

The following procedures are intended for deviations around adverse meteorological conditions.

When weather deviation is required, the pilot should initiate communication with ATC via voice or CPDLC. A rapid response may be obtained by either:

a) stating “WEATHER DEVIATION REQUIRED” to indicate that priority is desired on the frequency and for ATC response; or
b) requesting a weather deviation using a CPDLC lateral downlink message.

When necessary, the pilot should initiate the communications using the urgency call “PAN PAN” (preferably spoken three times) or by using a CPDLC urgency downlink message.

The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to its cleared route.

Actions To Be Taken If A Revised ATC Clearance Cannot Be Obtained

The provisions of this section apply to situations where a pilot needs to exercise the authority of a pilot-in-command under the provisions of ICAO Annex 2.

If the aircraft is required to deviate from track or ATS route to avoid adverse meteorological conditions and prior clearance cannot be obtained, an ATC clearance shall be obtained at the earliest possible time. Until an ATC clearance is received, the pilot shall take the following actions:

a) if possible, deviate away from an organized track or ATS route system;

b) establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: aircraft identification, flight level, position (including ATS route designator or the track code) and intentions, on the frequency in use and on 121.500 (or, as a backup, on the inter-pilot air to-air frequency 123.450);
c) watch for conflicting traffic both visually and by reference to ACAS (if equipped);
d) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);
e) for deviations of less than 9.3km (5NM) from the originally cleared track or ATS route remain at a level assigned by ATC;
f) for deviations greater than, or equal to 9.3km (5NM) from the originally cleared track or ATS route, when the aircraft is approximately 9.3km (5NM) from track, initiate a level change in accordance with the table below;
g) if the pilot receives clearance to deviate from cleared track or ATS route for a specified distance and, subsequently, requests, but cannot obtain a clearance to deviate beyond that distance, the pilot should apply an altitude offset in accordance with the table below before deviating beyond the cleared distance;
h) when returning to track or ATS route, be at its assigned flight level when the aircraft is within approximately 9.3km (5NM) of the centre line; and
i) if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

Note: If, as a result of actions taken under the provisions above, the pilot determines that there is another aircraft at or near the same flight level with which a conflict may occur, then the pilot is expected to adjust the path of the aircraft, as necessary, to avoid conflict.

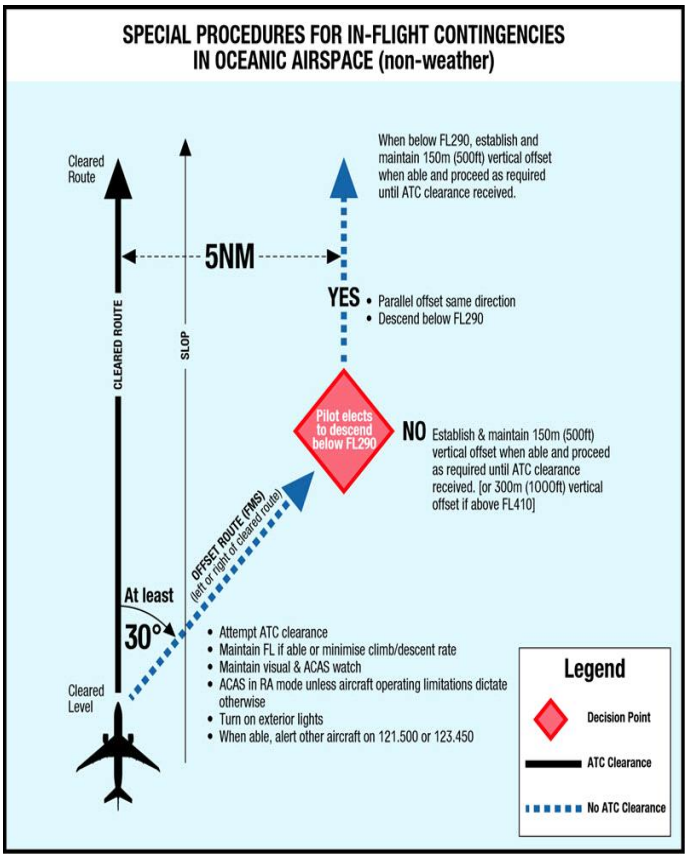
Originally Cleared Track or ATS route Centre Line	Deviations ≥ 9.3 km (5.0NM)	Level Change
EAST (000°-179° magnetic)	LEFT	DESCEND 300ft (90m)
	RIGHT	CLIMB 300ft (90m)
WEST (180°-359° magnetic)	LEFT	CLIMB 300ft (90m)
	RIGHT	DESCEND 300ft (90m)

224. The aircraft in oceanic RVSM airspace requiring rapid descent, turn-back or diversion, should initially leave its assigned route or track by turning right or left for ?
(RM 1.5.2.17.4.1)

Special Procedures for In-Flight Contingencies in Oceanic Airspace (ICAO Doc 4444)
General Procedures

If an aircraft is unable to continue the flight in accordance with its ATC clearance, a revised clearance shall be obtained, whenever possible, prior to initiating any action.

If prior clearance cannot be obtained, the following contingency procedures should be employed until a revised clearance is received. In general terms, the aircraft should be flown at an offset level and on an offset track where other aircraft are less likely to be encountered.



Leave the cleared track or ATS route by initially turning at least 30 degrees to the right or to the left, in order to establish and maintain a parallel, same direction track or ATS route offset 5NM (9.3km). The direction of the turn should be based on one or more of the following factors:
aircraft position relative to any organized track or ATS route system;
the direction of flights and flight levels allocated on adjacent tracks;
the direction to an alternate airport;
any strategic lateral offset being flown, and terrain clearance. maintain a watch for conflicting traffic both visually and by reference to ACAS (if equipped) leaving ACAS in RA mode at all times, unless aircraft operating limitations dictate otherwise;
turn on all aircraft exterior lights (commensurate with appropriate operating limitations);
keep the SSR transponder on at all times and, when able, squawk 7700, as appropriate and, if equipped with ADS-B or ADS-C, select the appropriate emergency functionality;
as soon as practicable, the pilot shall advise air traffic control of any deviation from their assigned clearance;
use means as appropriate (i.e. voice and/or CPDLC) to communicate during a contingency or emergency;
if voice communication is used, the radiotelephony distress signal (MAYDAY) or urgency signal (PAN PAN) preferably spoken three times, shall be used, as appropriate;
when emergency situations are communicated via CPDLC, the controller may respond via CPDLC. However, the controller may also attempt to make voice communication contact with the aircraft;
establish communications with and alert nearby aircraft by broadcasting on the frequencies in use and at suitable intervals on 121.500 (or, as a backup, on the inter-pilot air-to-air frequency

123.450): aircraft identification, the nature of the distress condition, intention of the PIC, position (including the ATS route designator or the track code, as appropriate) and flight level; and the controller should attempt to determine the nature of the emergency and ascertain any assistance that may be required. Subsequent ATC action with respect to that aircraft shall be based on the intentions of the pilot and overall traffic situation.

Actions to be Taken once Offset from Track

The pilot's judgement of the situation and the need to ensure the safety of the aircraft will determine the actions outlined to be taken. Factors for the pilot to consider when deviating from the cleared track or ATS route or level without an ATC clearance include, but are not limited to:

a) operation within a parallel track system;
b) the potential for User Preferred Routes (UPRs) parallel to the aircraft's track or route;
c) the nature of the contingency (e.g. aircraft system malfunction) and;
d) weather factors (e.g. convective weather at lower flight levels).

If possible maintain the assigned flight level until established on the 9.3km (5NM) parallel, same direction track or ATS route offset. If unable, initially minimize the rate of descent to the extent that is operationally feasible.

Once established on a parallel, same direction track or route offset by 9.3km (5NM), either: descend below FL290, and establish a 150m (500ft) vertical offset from those flight levels normally used, and proceed as required by the operational situation or if an ATC clearance has been obtained, in accordance with the clearance; or

Note: Descent below FL290 is considered particularly applicable to operations where there is a predominant traffic flow (e.g. east-west) or parallel track system where the aircraft's diversion path will likely cross adjacent tracks or ATS routes. A descent below FL290 can decrease the likelihood of conflict with other aircraft, ACAS RA events and delays in obtaining a revised ATC clearance.

establish a 150m (500ft) vertical offset (or 300m (1000ft) vertical offset if above FL410) from those flight levels normally used, and proceed as required by the operational situation, or if an ATC clearance has been obtained, proceed in accordance with the clearance.

Note: Altimetry System Errors (ASE) may result in less than 150m (500ft) vertical spacing (less than 300m (1000ft) above FL410) when the above contingency procedure is applied.

225. What is the missed approach climb gradient as a basis for OCA/OCH/OCL ?

(RM 1.5.5.6.1.5)

Missed Approach Segment (5)

Introduction

The following procedures are extracted from ICAO Doc 8168 Volume I (PANS OPS). For additional information, also refer to the following sub-chapter describing EASA Regulations:
Rules and Regulations 1.5.5.6.1.5.1. Missed Approach Procedure (EASA OPS)
Also refer to your operator-specific manuals (OM-A, OM-B)

Missed Approach Gradient

Normal missed approach procedures are based on a minimum climb gradient of 2.5 per cent. A gradient of 2 per cent may be used in the procedure construction if the necessary survey and safeguarding have been provided. With the approval of the appropriate authority, gradients of 3, 4 or 5 per cent may be used for aircraft whose climb performance permits an operational advantage to be thus obtained.

When a gradient other than 2.5% is used, this increased go-around climb gradient is indicated on the IAC minima section with e.g. "GA 3.5%". In addition to the DA/H or MDA/H for this gradient, the DA/H or MDA/H applicable to the nominal gradient will also be shown.

The pilot should be aware that a missed approach procedure which is based on the nominal climb gradient of 2.5 per cent or greater cannot be used by all aircraft when operating at high gross mass and non-normal configurations, including engine-out conditions. The operation of aircraft under these conditions needs special consideration at aerodromes that are critical due to obstacles on the missed approach area. This may result in a special procedure being established with a possible increase in the DA/H or MDA/H.

226. What are the segments of an instrument approach procedure ?

(RM 1.5.5.6.1)

Instrument Approach Procedure Segments

An instrument approach procedure may have five separate segments:

1. Arrival Route
2. Initial Approach Segment
3. Intermediate Approach Segment
4. Final Approach Segment
5. Missed Approach Segment

In addition, an area for circling the aerodrome under visual conditions is also considered.

The approach segments begin and end at designated fixes. However, under some circumstances certain of the segments may begin at specified points where no fixes are available. For example, the final approach segment of a precision approach may start where the intermediate flight altitude intersects the nominal glide path (the final approach point).

Arrival Route
A Standard Instrument Arrival Route (STAR) permits transition from the en-route phase to the approach phase. The arrival route normally ends at the IAF.

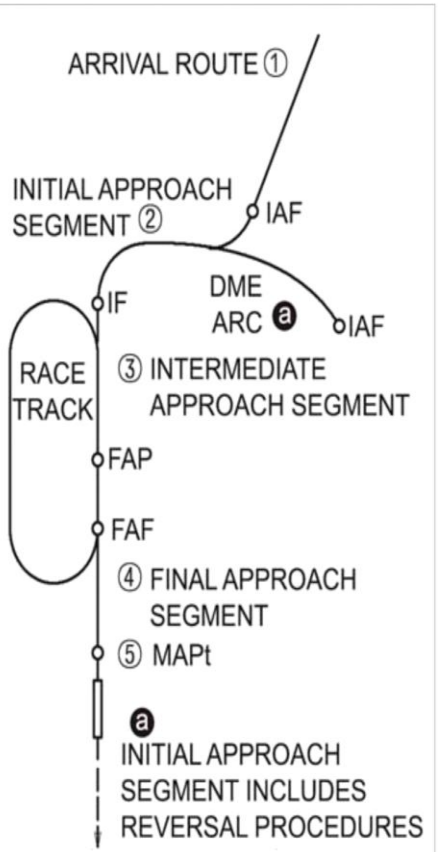
Initial Approach Fix (IAF)
IAF is defined as an aid/fix where the initial approach segment begins (generally marked on charts).

Intermediate Approach Fix (IF)
IF is defined as an intersection between the initial and the intermediate approach segments.

Final Approach Point (FAP)
At the Final Approach Point (FAP) the final approach segment commences. FAP is a point in space located on the final approach track where the intermediate approach altitude/height intercepts the nominal glide path or MLS elevation angle from which the descent to DA/DH is initiated.

Final Approach Fix (FAF)
FAF for a non-precision approach is defined as an aid/fix from which descent to the MDA/MDH is initiated. Comply with minimum altitudes according to descent profile.

Missed Approach Point (MAPt)
MAPt is defined as a point at which a missed approach procedure shall be executed if the required visual reference (runway and/or environment) is not achieved or a continuation of approach is unsafe.



Note: The following subparagraphs contain a description of the above shown approach segments (1) to (5) and related procedures.

227. What is the bank angle in a holding or racetrack and during a racetrack procedure, when should the outbound timing start ?

(RM 1.5.5.7.2.1)

Bank Angle/Rate of Turn

All turns shall be made at a bank angle of 25° or at a rate of 3° per second, whichever requires the lesser bank.

Allowance for Known Wind

All procedures depict tracks. The pilot should attempt to maintain the track by making allowance for known wind by applying corrections both to heading and timing. This should be done during entry and while flying in the holding pattern.

Start of Outbound Timing

Outbound timing begins over or abeam the fix, whichever occurs later. If the abeam position cannot be determined, start timing when the turn to outbound is completed.

Outbound Leg Length based on a Distance Measuring Equipment (DME) Distance

If the outbound leg length is based on a DME distance, then the outbound leg terminates as soon as the limiting DME distance is reached.

Limiting Radials

In the case of holding away from the station, where the distance from the holding fix to the very high frequency omnidirectional radio range/distance measuring equipment (VOR/DME) station is short, a limiting radial may be specified. A limiting radial may also be specified where airspace conservation is essential.

If the limiting radial is reached before the limiting DME distance, this radial should be followed until a turn inbound is initiated. The turn should be initiated at the latest where the limiting DME distance is reached.

Air Traffic Control (ATC) Notification

If for any reason a pilot is unable to conform to the procedures for normal conditions, ATC should be advised as early as possible.

228. What is the buffer area for a holding ? (RM 1.5.5.7.2.6)

Obstacle Clearance

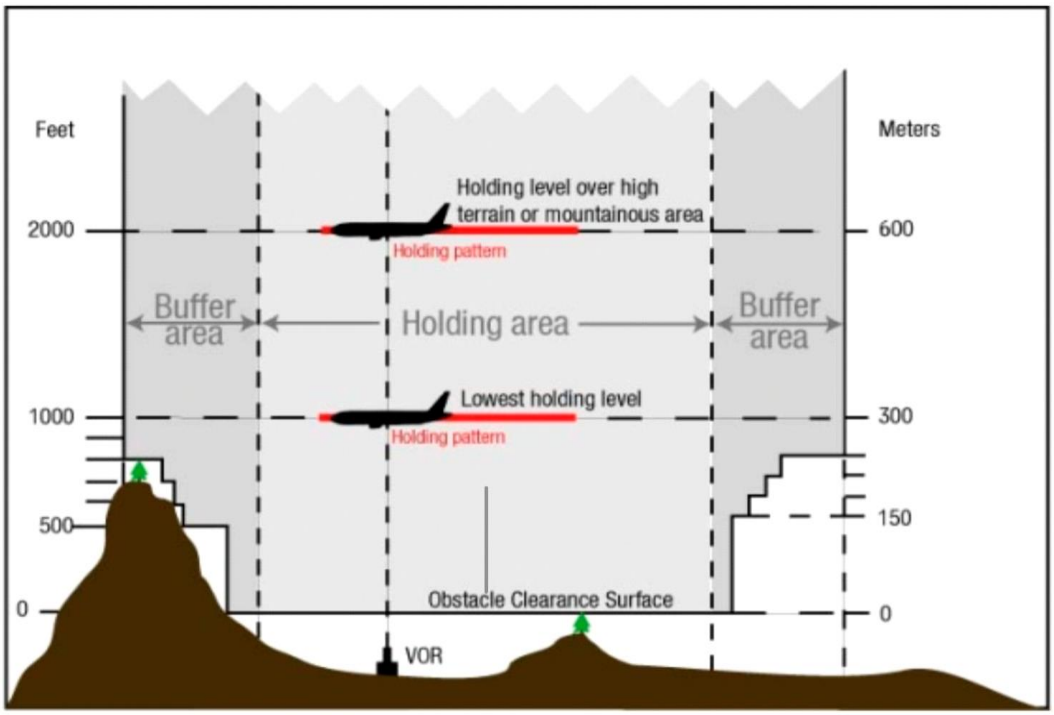
Buffer Area

An additional buffer area extends 5NM beyond the boundary of the holding area. Significant obstacles in the buffer area are taken into consideration when determining the minimum holding level.

Minimum Holding Level

The minimum permissible holding level provides a clearance of at least 300m (984ft) above obstacles in the holding area, and a clearance which ranges from 300m (984ft) at the edge of the holding area to a minimum of 60m (197ft) at the 5NM limit of the buffer area.

Figure 1 - Minimum holding level as determined by the obstacle clearance surface related to the holding area and the buffer area



Obstacle Clearance over High Terrain or in Mountainous Areas

Over high terrain or in mountainous areas, additional obstacle clearance up to a total of 600m (1969ft) is provided to accommodate the possible effects of turbulence, down drafts and other meteorological phenomena on the performance of altimeters.

229. What should be made for wind effect in a racetrack and reversal procedures ?

(RM 1.5.5.7.2.5)

Holding

Still Air Condition

After entering the holding pattern, on the second and subsequent arrivals over the fix, the aircraft turns to fly an outbound track to position the aircraft for the turn onto the inbound track. It continues outbound:

a) where timing is specified:
- for 1min if at or below 14000ft; or
- for 1.5min if above 14000ft; or

b) where distance is specified until the appropriate limiting DME distance is reached.

Then, the aircraft turns so as to realign itself on the inbound track.

Corrections for Wind Effect

Allowance should be made in both heading and timing to compensate for the effects of wind to ensure the inbound track is regained before passing the holding fix inbound. In making these corrections, full use should be made of the indications available from the navaid and estimated or known wind.

230. What are the ICAO standard maximum holding speeds ?

(RM 1.5.5.7.2.1)

Speeds

Holding patterns shall be entered and flown at or below the airspeeds given in the table below.

These speeds are rounded to the nearest multiple of five for operational reasons. From the standpoint of operational safety, these speeds are considered to be equivalent to the unrounded originals.

Holding Speeds - Aircraft Categories A through E (IAS or Mach)		
Levels[(1)]	**Normal Conditions**	**Turbulence Conditions**
≤ 14000ft	230KT[(2)]	280KT[(3)]
	170KT (CAT A and B aircraft only)	170KT (CAT A and B aircraft only)
> 14000ft - 20000ft	240KT[(4)]	280KT or 0.80 Mach whichever is less[(3)]
> 20000ft - 34000ft	265KT[(4)]	
> 34000ft	0.83 Mach	0.83 Mach
Note 1: The levels shown represent altitudes or corresponding flight levels depending on the altimeter setting in use.		

Note 2: When the holding procedure is followed by the initial segment of an IAP promulgated at a speed higher than 230KT, the holding should also be promulgated at this higher speed wherever possible.
Note 3: The speed of 280KT (0.80 Mach) reserved for turbulence conditions shall be used for holding only after prior clearance with ATC, unless the relevant publications indicate that the holding area can accommodate aircraft flight at these high holding speeds.
Note 4: Wherever possible, 280KT should be used for holding procedures associated with airway route structures.

231. What are the recurrent requirements for a CAT II/III ?

(OM-A 16.2)

FLIGHT CREW TRAINING AND EXPERIENCE

Recurrent Training and Checking—Low Visibility Operations

1. THAI must ensure that, in conjunction with the normal recurrent training and operator proficiency checks, a pilot's knowledge and ability to perform the tasks associated with the particular category of operation, for which he/she is authorized is checked. The required number of approaches to be undertaken in the flight simulator within the validity period of the operators proficiency check is to be a minimum of two, one of which must be a landing at the lowest approved RVR; in addition one of these approaches may be substituted by an approach and landing in the aeroplane using approved CAT II and III procedures. One missed-approach shall be flown during the conduct of the operators proficiency check. If the operator is authorized to conduct takeoff with RVR less than 150/200 m at least one LVTO to the lowest applicable minima shall be flown during the conduct of the operators proficiency check.

2. For CAT III operations, THAI must use a flight simulator.

3. THAI must ensure that, for CAT III operations on aeroplanes with a fail passive flight control system, including HUDLS, a missed approach is completed at least once over the period of three consecutive operator proficiency checks as the result of an autopilot failure at or below decision height when the last reported RVR was 300 m or less.

4. The Authority may authorize recurrent training and checking for CAT II and LVTO operations in an aeroplane type where no flight simulator to represent that specific aeroplane or an acceptable alternate is available.

NOTE: Recency for LTVO and CAT II/III based upon automatic approaches and/or auto-lands is maintained by the recurrent training and checking as prescribed in this paragraph.

Flight Crew Recency

To maintain CAT II/III qualification current, each crew member is required to have completed one CAT II approach and/or CAT III approach and landings as appropriate in the aircraft in a six-month period.

The approach may be satisfied by conducting practice of CAT II or III approaches and/or autoland in CAT I or better weather conditions.

232. What is the longitudinal separation minima based on time for aircraft at the same cruising level ?

(RM 1.5.2.12.6.2.2)

Longitudinal Separation Minima Based on Time

Aircraft Maintaining the Same Level
Aircraft Flying on the Same Track a) 15min; or b) 10min, if NAVAIDs permit frequent determination of position and speed; or c) 5min in the following cases, provided that in each case the preceding aircraft is maintaining a true airspeed of 37km/h (20KT) or more faster than the succeeding aircraft: - between aircraft that have departed from the same aerodrome; - between en-route aircraft that have reported over the same exact significant point; - between departing and en-route aircraft after the en-route aircraft has reported over a fix that is so located in relation to the departure point as to ensure that 5min separation can be established at the point the departing aircraft will join the air route; or d) 3min in the cases listed under c) provided that in each case the preceding aircraft is maintaining a true airspeed of 74km/h (40KT) or more faster than the succeeding aircraft.
Aircraft Flying on Crossing Tracks a) 15min at the point of intersection of the tracks; or b) 10min if NAVAIDs permit frequent determination of position and speed.
Aircraft Climbing or Descending
Aircraft on the Same Track When an aircraft will pass through the level of another aircraft on the same track, the following minimum longitudinal separation shall be provided: a) 15min while vertical separation does not exist; or b) 10min while vertical separation does not exist, provided that such separation is authorized only where ground-based NAVAIDs or GNSS permit frequent determination of position and speed; or c) 5min while vertical separation does not exist, provided that: - the level change is commenced within 10min of the time the second aircraft has reported over a common point which must be derived from ground-based NAVAIDs or by GNSS; and - when issuing the clearance through third party communication or CPDLC a restriction shall be added to the clearance to ensure that the 10min condition is satisfied. **Note:** To facilitate application of the procedure where a considerable change of level is involved, a descending aircraft may be cleared to some convenient level above the lower aircraft, or a climbing aircraft to some convenient level below the higher aircraft, to permit a further check on the separation that will be obtained while vertical separation does not exist.
Aircraft on Crossing Tracks a) 15min while vertical separation does not exist; or

b) 10min while vertical separation does not exist if NAVAIDs permit frequent determination of position and speed.

Aircraft on Reciprocal Tracks

Where lateral separation is not provided, vertical separation shall be provided for at least 10min prior to and after the time the aircraft are estimated to pass, or are estimated to have passed. Provided it has been determined that the aircraft have passed each other, this minimum need not apply.

233. What is the longitudinal separation minima with Mach number technique based on time ?

(RM 1.5.2.12.6.2.4)

RM 1.5.2.12.6.2.4. Longitudinal Separation Minima with Mach Number Technique Based on Time

Aircraft subject to Mach Number Technique (MNT) shall adhere to the true Mach number approved by ATC and shall request ATC approval before making any changes thereto. If it is essential to make an immediate temporary change in the Mach number (e.g. due to turbulence), ATC shall be notified as soon as possible that such a change has been made.

If it is not feasible, due to aircraft performance, to maintain the last assigned Mach number during en-route climbs and descents, pilots of aircraft concerned shall advise ATC at the time of the climb/descent request.

When the Mach number technique is applied and provided that:

a) the aircraft concerned have reported over the same common point and follow the same track or continuously diverging tracks until some other form of separation is provided; or

b) if the aircraft have not reported over the same common point and it is possible to ensure, by radar, ADS-B or other means, that the appropriate time interval will exist at the common point from which they either follow the same track or continuously diverging tracks;

minimum longitudinal separation between aircraft on the same track, whether in level, climbing or descending flight shall be:

a) 10min; or

b) between 9 and 5min inclusive, provided that:

the preceding aircraft is maintaining a true Mach number greater than the following aircraft in accordance with the following:

– 9min, if the preceding aircraft is Mach 0.02 faster than the following aircraft;
– 8min, if the preceding aircraft is Mach 0.03 faster than the following aircraft;
– 7min, if the preceding aircraft is Mach 0.04 faster than the following aircraft;
– 6min, if the preceding aircraft is Mach 0.05 faster than the following aircraft;
– 5min, if the preceding aircraft is Mach 0.06 faster than the following aircraft.

When the 10min longitudinal separation minimum with Mach number technique is applied, the preceding aircraft shall maintain a true Mach number equal to or greater than that maintained by the following aircraft.

234. What is the longitudinal separation minima based on distance using DME for aircraft at the same cruising level ?

(RM 1.5.2.12.6.2.3)

RM 1.5.2.12.6.2.3. Longitudinal Separation Minima Based on Distance Using DME and/or GNSS

Note: Where the term "on track" is used in the provisions relating to the application of longitudinal separation minima using DME and/or GNSS, it means that the aircraft is flying either directly inbound to or directly outbound from the station/waypoint.

Separation shall be established by maintaining not less than specified distance(s) between aircraft positions as reported by reference to DME in conjunction with other appropriate NAVAIDs and/or GNSS. This type of separation shall be applied between two aircraft using DME, or two aircraft using GNSS, or one aircraft using DME and one aircraft using GNSS. Direct controller-pilot VHF voice communication shall be maintained while such separation is used.

Note: For the purpose of applying GNSS-based separation minimum, a distance derived from an integrated navigation system incorporating GNSS input is regarded as equivalent to GNSS distance.

When applying these separation minima between any aircraft with area navigation capability, controllers shall specifically request GNSS-derived distance.

Note: Reasons making a pilot unable to provide GNSS distance information may include inadequate on-board equipment, no GNSS input into an integrated navigation system, or a loss of GNSS integrity.

Aircraft at the Same Cruising Level
Aircraft on the Same Track a) 37km (20NM), provided: - each aircraft utilizes: i) the same "on-track" DME station when both aircraft are utilizing DME; or ii) an "on-track" DME station and a collocated waypoint when one aircraft is utilizing DME and the other is utilizing GNSS; or iii) the same waypoint when both aircraft are utilizing GNSS; and - separation is checked by obtaining simultaneous DME and/or GNSS readings from the aircraft at frequent intervals to ensure that the minimum will not be infringed; b) 19km (10NM), provided: - the leading aircraft maintains a true airspeed of 37km/h (20KT) or more faster than the succeeding aircraft; - each aircraft utilizes: i) the same "on-track" DME station when both aircraft are utilizing DME; or ii) an "on-track" DME station and a collocated waypoint when one aircraft is utilizing DME and the other is utilizing GNSS; or iii) the same waypoint when both aircraft are utilizing GNSS; and - separation is checked by obtaining simultaneous DME and/or GNSS readings from the aircraft at such intervals as are necessary to ensure that the minimum is established and will not be infringed.

Aircraft on Crossing Tracks

The longitudinal separation prescribed above shall also apply provided each aircraft reports distance from the DME station and/or collocated waypoint or same waypoint located at the crossing point of the tracks and that the relative angle between the tracks is less than 90 degrees.

235. What is the longitudinal separation minima based on distance using RNAV where RNP is specified for aircraft at the same cruising level ?
(RM 1.5.2.12.6.2.6)

Longitudinal Separation Minima Based on Distance Using RNAV Where RNP is Specified
Within designated airspace, or on designated routes, separation minima in accordance with the provisions of this section may be used, subject to regional air navigation agreements.

Separation shall be established by maintaining not less than the specified distance between aircraft positions as reported by reference to the same “on-track” common point, whenever possible ahead of both aircraft, or by means of an automated position reporting system.

Note: The term “on track” means that the aircraft is flying either directly inbound to or directly outbound from the station or waypoint.

When information is received indicating navigation equipment failure or deterioration below the navigation performance requirements, ATC shall then, as required, apply alternative separation minima.

Direct controller-pilot communications shall be maintained while applying a distance-based separation minima. Direct controller-pilot communications shall be voice or CPDLC. The communication criteria necessary for CPDLC to satisfy the requirement for direct controller-pilot communications shall be established by an appropriate safety assessment.

Prior to and during the application of a distance-based separation minimum, the controller should determine the adequacy of the available communication link, considering the time element required to receive replies from two or more aircraft, and the overall workload/traffic volume associated with the application of such minima.

When aircraft are at, or are expected to reduce to, the minimum separation applicable, speed control techniques, including assigning Mach number, shall be applied to ensure that the minimum distance exists throughout the period of application of the minima.

Longitudinal Distance-based Separation Minima in an RNP RNAV

Environment not Using ADS-C

For aircraft cruising, climbing or descending on the same track, the following separation minimum may be used:

Separation Minimum	RNP Type	Communication Requirement	Surveillance Requirement	Distance Verification Requirements
93km (50NM)	10	Direct controller-pilot communications	Procedural position reports	At least every 24min

Note: Where a considerable change of level is involved using distance-based separation, a descending aircraft may be cleared to some convenient level above the lower aircraft, or a climbing aircraft to some convenient level below the higher aircraft (e.g. 1200m (4000ft) or less) to permit a further check on the separation that will be maintained while vertical separation does not exist.

During the application of the 93km (50NM) separation, when an aircraft fails to report its position, the controller shall take action within 3min to establish communication. If communication has not been established within 8min of the time the report should have been received, the controller shall take action to apply an alternative form of separation.
Where automated position reporting applies, a common time reference shall be used.

Aircraft on Reciprocal Tracks

Aircraft may be cleared to climb or descend to or through the levels occupied by the other provided that it has been positively established that the aircraft have passed each other and the distance between them is equal to at least the applicable separation minimum.

Longitudinal Distance-based Separation Minima in an RNP RNAV Environment Using ADS-C

Separation based on the use of ADS-C shall be applied so that the distance between the calculated positions of the aircraft is never less than the prescribed minimum. This distance shall be obtained by one of the following methods:

when the aircraft are on the same identical track, the distance may be measured between the calculated positions of the aircraft or may be calculated by measuring the distances to a common point on the track;

Note: Same identical tracks are a special case of same track where the angular difference is zero degrees or reciprocal tracks where the angular difference is 180 degrees.

when the aircraft are on same or reciprocal non-parallel tracks other than in a) above, the distance shall be calculated by measuring the distances to the common point of intersection of the tracks or projected track; and when the aircraft are on parallel tracks whose protection areas overlap, the distance shall be measured along the track of one of the aircraft as in a) above using its calculated position and the point abeam the calculated position of the other aircraft.

When aircraft are at, or are expected to reduce to, the minimum separation applicable, speed control techniques, including assigning Mach number, shall be applied to ensure that the minimum distance exists throughout the period of application of the minima.

For aircraft cruising, climbing or descending on the same track, the following separation minima may be used:

Separation Minima	RNP Type	Maximum ADS-C Periodic Reporting Interval
93km (50NM)	10	27min
	4	32min
55.5km (30NM)	4	14min

The communication system provided to enable the application of the separation minima above shall allow a controller, within 4min, to intervene and resolve a potential conflict by contacting an aircraft using the normal means of communication. An alternative means shall be available to allow the controller to intervene and resolve the conflict within a total time of 10.5min, should the normal means of communication fail.

When an ADS-C periodic or waypoint change event report is not received within 3min of the time it should have been sent, the report is considered overdue and the controller shall take action to obtain the report as quickly as possible, normally by ADS-C or CPDLC. If a report is not received within 6min of the time the original report should have been sent, and there is a possibility of loss of separation with other aircraft, the controller shall take action to resolve any potential conflict(s) as soon as possible. The communication means provided shall be such that the conflict is resolved within a further 7.5min.

Opposite-direction aircraft on reciprocal tracks may be cleared to climb or descend to or through the levels occupied by another aircraft provided that the aircraft have passed each other by the applicable separation minimum, calculated in accordance with "Longitudinal Distance-based Separation Minima in an RNP RNAV Environment not Using ADS-C".

236. What is the longitudinal separation minima based on distance using RNAV for aircraft at the same cruising level ?
(RM 1.5.2.12.6.2.6)

Longitudinal Separation Minima Based on Distance Using RNAV Where RNP is Specified
Within designated airspace, or on designated routes, separation minima in accordance with the provisions of this section may be used, subject to regional air navigation agreements.

Separation shall be established by maintaining not less than the specified distance between aircraft positions as reported by reference to the same “on-track” common point, whenever possible ahead of both aircraft, or by means of an automated position reporting system.

Note: The term “on track” means that the aircraft is flying either directly inbound to or directly outbound from the station or waypoint.

When information is received indicating navigation equipment failure or deterioration below the navigation performance requirements, ATC shall then, as required, apply alternative separation minima.

Direct controller-pilot communications shall be maintained while applying a distance-based separation minima. Direct controller-pilot communications shall be voice or CPDLC. The communication criteria necessary for CPDLC to satisfy the requirement for direct controller-pilot communications shall be established by an appropriate safety assessment.

Prior to and during the application of a distance-based separation minimum, the controller should determine the adequacy of the available communication link, considering the time element required to receive replies from two or more aircraft, and the overall workload/traffic volume associated with the application of such minima.

When aircraft are at, or are expected to reduce to, the minimum separation applicable, speed control techniques, including assigning Mach number, shall be applied to ensure that the minimum distance exists throughout the period of application of the minima.

Longitudinal Distance-based Separation Minima in an RNP RNAV

Environment not Using ADS-C

For aircraft cruising, climbing or descending on the same track, the following separation minimum may be used:

Separation Minimum	RNP Type	Communication Requirement	Surveillance Requirement	Distance Verification Requirements
93km (50NM)	10	Direct controller-pilot communications	Procedural position reports	At least every 24min

Note: Where a considerable change of level is involved using distance-based separation, a descending aircraft may be cleared to some convenient level above the lower aircraft, or a climbing aircraft to some convenient level below the higher aircraft (e.g. 1200m (4000ft) or less) to permit a further check on the separation that will be maintained while vertical separation does not exist.

During the application of the 93km (50NM) separation, when an aircraft fails to report its position, the controller shall take action within 3min to establish communication. If communication has not been established within 8min of the time the report should have been received, the controller shall take action to apply an alternative form of separation.

Where automated position reporting applies, a common time reference shall be used.

Aircraft on Reciprocal Tracks

Aircraft may be cleared to climb or descend to or through the levels occupied by the other provided that it has been positively established that the aircraft have passed each other and the distance between them is equal to at least the applicable separation minimum.

Longitudinal Distance-based Separation Minima in an RNP RNAV Environment Using ADS-C

Separation based on the use of ADS-C shall be applied so that the distance between the calculated positions of the aircraft is never less than the prescribed minimum. This distance shall be obtained by one of the following methods:

when the aircraft are on the same identical track, the distance may be measured between the calculated positions of the aircraft or may be calculated by measuring the distances to a common point on the track;

Note: Same identical tracks are a special case of same track where the angular difference is zero degrees or reciprocal tracks where the angular difference is 180 degrees.

when the aircraft are on same or reciprocal non-parallel tracks other than in a) above, the distance shall be calculated by measuring the distances to the common point of intersection of the tracks or projected track; and

when the aircraft are on parallel tracks whose protection areas overlap, the distance shall be measured along the track of one of the aircraft as in a) above using its calculated position and the point abeam the calculated position of the other aircraft.

When aircraft are at, or are expected to reduce to, the minimum separation applicable, speed control techniques, including assigning Mach number, shall be applied to ensure that the minimum distance exists throughout the period of application of the minima.

For aircraft cruising, climbing or descending on the same track, the following separation minima may be used:

Separation Minima	RNP Type	Maximum ADS-C Periodic Reporting Interval
93km (50NM)	10	27min
	4	32min
55.5km (30NM)	4	14min

The communication system provided to enable the application of the separation minima above shall allow a controller, within 4min, to intervene and resolve a potential conflict by contacting an aircraft using the normal means of communication. An alternative means shall be available to allow the controller to intervene and resolve the conflict within a total time of 10.5min, should the normal means of communication fail.

When an ADS-C periodic or waypoint change event report is not received within 3min of the time it should have been sent, the report is considered overdue and the controller shall take action to obtain the report as quickly as possible, normally by ADS-C or CPDLC. If a report is not received within 6min of the time the original report should have been sent, and there is a possibility of loss of separation with other aircraft, the controller shall take action to resolve any potential conflict(s) as soon as possible. The communication means provided shall be such that the conflict is resolved within a further 7.5min.

Opposite-direction aircraft on reciprocal tracks may be cleared to climb or descend to or through the levels occupied by another aircraft provided that the aircraft have passed each other by the applicable separation minimum, calculated in accordance with "Longitudinal Distance-based Separation Minima in an RNP RNAV Environment not Using ADS-C".

237. What is the category of wake turbulence and there separation minima ?

(RM 1.5.2.12.1.1, RM1.5.2.12.1.2)

Wake Turbulence Categories and Groups of Aircraft

The term “wake turbulence” is used in this context to describe the effect of the rotating air masses generated behind the wing tips of jet aircraft, in preference to the term “wake vortex” which describes the nature of the air masses.

Wake Turbulence Categories (WTC) of Aircraft

Wake turbulence separation minima shall be based on a grouping of aircraft types into four categories according to the maximum certificated take-off mass as follows:

Wake Turbulence Category		Aircraft Type, Maximum Certificated Take-off Mass
J	SUPER	A388 and A225
H	HEAVY	136000kg or more; except A388 and A225
M	MEDIUM	Less than 136000kg but more than 7000kg
L	LIGHT	7000kg or less

Wake Turbulence Separation Minima

The ATC unit concerned shall not be required to apply wake turbulence separation:
for arriving VFR flights landing on the same runway as a preceding landing SUPER, HEAVY or MEDIUM aircraft; and
between arriving IFR flights executing visual approach when the aircraft has reported the preceding aircraft in sight and has been instructed to follow and maintain own separation from that aircraft.

The ATC unit shall, in respect of the flights specified in a) and b) above, as well as when otherwise deemed necessary, issue a caution of possible wake turbulence. The PIC of the aircraft concerned shall be responsible for ensuring that the spacing from a preceding aircraft of a heavier wake turbulence category is acceptable. If it is determined that additional spacing is required, the flight crew shall inform the ATC unit accordingly, stating their requirements.

When Using Wake Turbulence Categories (WTC)

WTC		Time-based Wake Turbulence Longitudinal Separation Minima (Minutes)					Distance-based Wake Turbulence Separation Minima (NM) (5)
Lead	Follow	Departure		Arrival	Displaced Landing Threshold (3)	Opposite Direction (4)	
		Full Length (1)	Intermediate (2)				
SUPER	HEAVY	2	3	2	2	3	5
	MEDIUM	3	4	3	3	4	7
	LIGHT	3	4	4	3	4	8
HEAVY	HEAVY	-	-	-	-	-	4
	MEDIUM	2	3	2	2	3	5
	LIGHT	2	3	3	2	3	6
MEDIUM	LIGHT	2	3	3	2	3	5

(1)	Departing aircraft when using: • the same runway; • parallel runways separated by less than 760m (2500ft); • runways if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 300m (1000ft) below; • parallel runways separated by 760m (2500 ft) or more, if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 300m (1000ft) below.
(2)	Aircraft taking off from: • an intermediate part of the same runway; or • an intermediate part of a parallel runway separated by less than 760m (2500ft).
(3)	Operating on a runway with displaced landing threshold if the projected flight paths are expected to cross:

	• a departing HEAVY aircraft following a SUPER aircraft arrival • a departing LIGHT or MEDIUM aircraft following a SUPER aircraft arrival • a departing LIGHT or MEDIUM aircraft following a HEAVY aircraft arrival • a departing LIGHT aircraft following a MEDIUM aircraft arrival • an arriving HEAVY aircraft following a SUPER aircraft departure • an arriving LIGHT or MEDIUM aircraft following a SUPER aircraft departure • an arriving LIGHT or MEDIUM aircraft following a HEAVY aircraft departure • an arriving LIGHT aircraft following a MEDIUM aircraft departure
(4)	When a heavier aircraft is making a low or missed approach and when the lighter aircraft is: • using an opposite-direction runway for take-off; or • landing on the same runway in the opposite direction, or on a parallel opposite-direction runway separated by less than 760m (2500ft).
(5)	Applied to aircraft being provided with an ATS surveillance service in the approach and departure phases of flight , when: • an aircraft is operating directly behind another aircraft at the same altitude or less than 300m (1000ft) below; or • both aircraft are using the same runway, or parallel runways separated by less than 760m (2500ft); or • an aircraft is crossing behind another aircraft at the same altitude or less than 300m (1000ft) below.

238. Define " Vicinity (VC) " ?

(RM 1.4.2.5.4)

VC: Between approximately 8 and 16 km of the aerodrome reference point and used only in METAR and SPECI with present weather

239. What is a go-around versus a missed approach procedure ?

(DOC4444).

A go-around is a procedure to establish the aircraft in a climb to abandon landing. This is done when the approach to the selected runway cannot be continued due to circumstances such as a blocked runway, a non-stabilized approach, or for other operational reasons.

A missed approach procedure is to be followed when an instrument approach cannot be continued usually when the required visual reference for landing is not attained by the published minimums, operational or technical circumstances. It is designed as a part of an instrument approach to ensure terrain clearance in a missed approach.

A go-around can be performed by following a missed approach procedure, SID, or visually if the P-i-C deems terrain clearance is adequate for the circumstance. However, for the purpose of Pilot-ATC communication, phraseology transmitted by the pilot in a missed approach circumstance is used as GOING AROUND in the ICAO PANS-RAC

240. What do you do in the event of suspected food poisoning ? (PHM 10.9.2)

Suspected Food Poisoning

In the event of suspected food poisoning, e.g. illnesses with vomiting, diarrhea, stomach pains, etc., during a flight, the flight deck crew will communicate with station staff at the next point of landing.

The ASM shall assist as follows:

- contact the nearest hospital, if information from the aircraft indicates the need of hospitalization,
- inform the hospital of the number of sick passengers and symptoms reported,
- arrange transportation to hospital,
- report the incident to BKKKB (for stations within Thailand), BKKKS (for stations abroad), BKKS4, BKKWL, BKKWU, BKKJI and General Manager.

Experience shows most cases of food poisoning on board result from food eaten prior to the flight.

To protect THAI and caterer against irrelevant claims, cabin crew are instructed to gather all possible information as well as samples of leftovers from all meals consumed by sick passengers on board.

The food samples are to be sent directly to THAI Catering Laboratory in Bangkok (BKKCZ-G), and BKKCZ and BKKCF shall be informed by telex.

241. Explain what kind of passenger not acceptable for travel and procedure for refusal of passengers? (PHM 3.2)

Passengers Not Acceptable for Travel

Under general conditions of carriage, THAI will, in the exercise of reasonable discretion, refuse to carry and/or cancel the reserved space of, and/ or remove at any place en route, any passenger:

- who refuses to present himself/herself and/or baggage for security control
- who fails to observe or refuses to obey safety rules or instructions of the Company
- who is obviously under the influence of alcohol, drugs or narcotics
- whose appearance, behavior, medical condition, or kind of nursing might be hazardous or offensive to other passengers
- with such degree of physical infirmity that the trip is likely to result in complication or death
- who requires individual nursing or care during flight and who is not accompanied by attendants
- who is handcuffed or manacled (prisoner)
- who is traveling to or via stations in certain countries if not holding required entry documents according to TIM
- who presents a ticket issued to another person
- who is pregnant and expects to deliver within 2 weeks or less
- under 5 years of age who travels alone
- who is newly born (normal or premature) within the first 7 days after birth.

Passengers of the above categories may not be ticketed or accepted for transportation.

Procedure for Refusal of Passage

No exact rules are given on how to act in each individual case, therefore, it is left to the staff who handle these matters to use their sound judgement and common sense.
All cases of refused carriage shall be treated with great courtesy and positive attitude toward the passengers.

The decision to refuse passage to a passenger must be taken by one of the following executives, their superiors, or by any person regularly acting for them during absence, or by any person to whom such authority has been delegated:

- The P-i-C of the flight
- The Airport Services Manager (ASM)
- The executive in charge of passenger sales in any region or district.

Note: Refusal of passage is a serious decision which may result in legal action.

Refusal of passage should be made as privately as possible and the passenger (or those connected with him) be advised of such decision discreetly and tactfully. Persons having been refused passage must be treated with the same courtesy as other passengers. The executive or supervisory personnel taking such action must remain present until the incident has been finalized.

Words such as “off-loaded” or slang phrases should never be used in public or in conversation with passengers.

No THAI employee may imply that a passenger is intoxicated but the airport services manager/ representative can indicate to him that his apparent condition is unsuitable for air travel and objectionable to his fellow travelers and crew. When dealing with a passenger en route, such action must be coordinated with the P-i-C’s.

Important Notice

In order to enable necessary steps for possible refusal of passage to be taken at the earliest possible stage, any member of the station staff who observes that a passenger shows visible signs of being under the influence of alcohol, drugs, narcotics, or similar MUST advise his/her supervisor IMMEDIATELY of such observations.

Passengers who are refused passage or removed en-route shall be given all possible assistance in arranging local transportation, hotel accommodations, medical attendance if requested or needed. However, the sole recourse of such passenger shall be a recovery of refund of the unused portion of ticket.

242. What does wind shear characteristics affect pitch and airspeed ? (OM-A 8.3.8.5.3)

Wind Shear

Pre Flight

During flight preparation, consider the possibility of windshear if:

- extreme variations in wind velocity and direction in a relatively short time span
- evidence of a gust front such as blowing dust on the airport surface
- surface temperature in excess of 30 deg. C
- dew point spread of 4 deg. C or more
- virga (precipitation that falls from the bases of high altitude cumulus clouds but evaporates before reaching the ground) are present
- on airports, when equipped, low level windshear alert is active (LLWAS)
- the forecasts indicate thunderstorm or frontal activity in the departure or arrival area. Examine the takeoff area with aircraft radar to determine if thunderstorm cells are in the vicinity of the airport.

In Flight

Pilot reports are the best indicator of windshear.

PIREPS to ATC should include:

- location of shear encountered
- altitude of shear encountered
- airspeed changes experienced (in knot, gain or loss)

Wind Shear Characteristics

Rapid pitch and airspeed change.

Headwind condition:

- on a glide path, a higher than normal pitch attitude, greater thrust setting and a decreased vertical speed.

Tailwind condition:

- lower than normal pitch attitude, a decreased thrust setting and an increase in vertical speed.

Wind Shear Detection

- Use the Low Level Wind shear Alert System (LLWAS) installed on the periphery of certain airports.
- Use the aircraft equipment, such as RNAV, INS, IRS or Doppler to detect wind shear as they allow comparison between ground speed and airspeed.
- Any rapid change in the relation between airspeed and ground speed represents a wind shear.
- Compare wind at the initial approach altitude with the reported runway surface wind. If those winds are of different direction and/or strength, a wind shear situation may occur.

Flight Procedures

- Wind shear awareness and proper training form the bases of wind shear accident prevention.
- Flight crew's actions are divided into three stages:

- avoidance
- prevention
- recovery.

Takeoff and Climb

- Avoidance:
  - do not takeoff into a strong downburst
  - do not takeoff when severe wind shear (wind shear that produces airspeed changes greater
  - than 15 kt, and/or vertical speed changes greater than 500 fpm) are reported
  - search for any clue to the presence of wind shear along the intended flight path like
  - PIREPS
  - LLWAS WARNINGs
  - thunderstorms and Virga.

- Prevention:

  If a takeoff has been decided upon in showery condition, or in other weather situations where the presence of wind shear cannot be ruled out, the following precautions are advised (check FCOM for specific aircraft type):

  – consider using a different runway
  – takeoff in crosswind condition may be preferable to a decreasing performance wind shear direction
  – use longest available runway with least probability of wind shear encounter
  – use Max available runway length
  – use full takeoff power
  – delay rotation slightly if runway length is excessive and obstacles during climb are not a factor
  – do not increase VR more than 20 kt. Observe maximum tire speed
  – use normal rotation rate and pitch
  – increase pitch to the tail strike limited angle if lift-off does not take place well before the runway end
  – rotate further if climb is insufficient
  – reduce pitch slightly again f stick shaker, stall buffet or any other sign of impending stall are experienced
  – achieve best performance via smooth pitch change with determined but steady elevator
  – inputs
  – do not yank the control column as This reduces the aerodynamic capability and give
  – unreliable pre stall WARNINGs
  – reach an angle of attack that gives a positive climb.

    ***Note**: Neither the airspeed indicator, the FD nor the horizon indicates angle of attack*

    ***Note**: On most aircraft types, flight director pitch bar and speed command indications cannot be used, since they are limited to max nose up attitude. Check FCOM for the respective aircraft types.*

  – balance pitch to fly just below the stick shaker onset speed in extreme conditions
  – do not fly with pre-stall WARNING on continuously

- recheck that power is at maximum
- use all available power by moving the throttles to the mechanical stops if there is a risk of hitting terrain or obstacles
- rotate beyond the stick shaker attitude just before impact if ground contact is unavoidable
- delay turning, if terrain and obstacle permit, until safe altitude and speed are obtained, especially if turning away from the wind.

- Recovery:
  - once obstacle clearance is assured, reduce pitch attitude on climb to achieve V2 + 25 kt by
  - minimizing reductions from the initial climb pitch attitude
  - accelerate and configure for en-route climb as soon as practicable.

Approach and Landing

***Note**: The majority of wind shear accidents occur during approach and landing.*

- Avoidance:

  delay, abandon the approach or divert If known severe wind shear is reported.

- Prevention:
  - review PM's duties of monitoring
  - speed
  - glide path
  - sink rate
  - PM must call for a go-around immediately if becoming unstabilized
  - fly an automatic approach unless specified in FCOM
  - execute a go-around if the autopilot disconnects
  - monitoring autopilot and auto throttles
  - put hands on wheel/stick and throttles
  - be alert for quick manual inputs
  - check respective FCOM for limitations
  - use a reduced approach flap setting to improve goaround capability if the landing runway is very long and if a consistent decreased performance type wind shear is expected.

    Caution: **In showery conditions, the wind shifts rapidly, making speed control more difficult with a reduced flap setting. An airspeed increase cannot be bled off without down spooling the engines to an undesirable degree.**

  - therefore, when conditions vary or are uncertain, the use of full flaps may be safer
  - make full use of wind and ground speed indication if available
  - monitoring the ground speed continuously to detect a possible wind shear early
  - use the indicated ground speed to evaluate the required correction to the approach/ threshold speed
  - increase Approach speed according to available runway length up to a Max of 20 kt

    Caution: **In a consistent increased performance wind shear, there will be a tailwind on the intermediate approach.**

– the whole approach will tend to become uncomfortably fast and your interest is to keep the speed down. Select manual landing flaps early and aim for VA from the outer marker

Caution: **A consistent decreased performance wind shear is typically a strong headwind on the approach, which diminishes near the ground.**

– to maintain VA throughout the approach will require a very high power setting on short final, due to the need for inertial acceleration, as the wind weakens. It is better to decide on a speed increment, which can be safely bled off as you pass through the wind shear

WARNING: **Keep speed slow if there is a tailwind on the approach.**

Add speed to VA if there is strong headwind.

– decide and brief at early stage on the max IAS acceptable on a short final in order to land
– a 10 kt increment in threshold speed should not give any trouble in stopping on a minimum RWY length provided correct landing/stopping techniques are used
– for more than 10 kt over speed, additional RWY must be available according to the
– respective FCOM and GWC
– do not float/“kiss-land” as Landing distance increases dramatically
– make a determined landing at the correct touchdown point
– do not reduce power drastically if a sudden, large airspeed increase is experienced on final approach as very often a drop in airspeed follows shortly after, due to wind shear variation
– make a go-around if the speed stays over the value agreed upon in the approach briefing
– request ATC to keep you currently informed of pilot reports, surface wind, available wind shear measurements and alerts

WARNING: **Be prepared to execute an immediate go-around with aggressive power application and determined rotation if unacceptable sink rate or airspeed changes occur when below 500 ft altitude.**

- Recovery

  Initiate a go-around immediately if:

  – the flight path control becomes marginal below 500 ft above the ground
  – IAS deviates more than 15 kt
  – vertical speed deviates more than 500 fpm
  – pitch attitude change deviates more than 5°
  – glide path displacement change deviates more than 1 dot.

  The following procedures shall be applied without delay:

- if ground contact could be a factor:
  – use maximum available engine power
  – rotate up to stick shaker onset
  – delay flap and gear retraction to keep stall margin
  – do not attempt to regain lost airspeed until the risk of terrain contact is no longer a factor
  – follow procedures as per the relevant FCOM

243. What is the Runway Condition Assessment Matrix (RCAM) ? (Lido General 1.4.9.3)

Runway Condition Assessment Matrix (RCAM)

The RCAM groups different runway conditions to a Runway Condition Code (RWYCC). Each code corresponds to an aircraft performance level and represents the deceleration capability and the directional control capability to be expected.

The airport operator starts the runway condition assessment by observing for each runway third:
- Type of contaminant (only those types shown in the RCAM)
- Depth of contaminant (if applicable)
- Percent coverage

Using the RCAM, the airport operator will then assign the respective RWYCC to each runway third.

Furthermore, all other observations are collected that are important for the operation of aircraft, like: cleared runway width, snowbanks, taxiway conditions, etc.

Assessment Criteria		Downgrade Assessment Criteria	
Runway Condition Code (RWYCC)	**Runway Surface Description**	**Aeroplane Deceleration or Directional Control Observation**	**Pilot Report of Runway Braking Action**
6	▪ DRY	---	---
5	▪ FROST ▪ WET (The runway surface is covered by any visible dampness or water up to and including 3mm depth) **Up to and including 3mm depth:** ▪ SLUSH ▪ DRY SNOW ▪ WET SNOW	Braking deceleration is normal for the wheel braking effort applied AND directional control is normal.	GOOD
4	**Up to and including 3mm depth:** ▪ SPECIALLY PREPARED WINTER RUNWAY **–15° C and Lower outside air temperature:** ▪ COMPACTED SNOW	Braking deceleration OR directional control is between Good and Medium	GOOD TO MEDIUM
3	▪ WET / SLIPPERY WET ▪ DRY SNOW or WET SNOW (any depth) ON TOP OF COMPACTED SNOW	Braking deceleration is noticeably reduced for the wheel braking effort applied	MEDIUM

	More than 3mm depth: ▪ DRY SNOW ▪ WET SNOW **Higher than −15° C outside air temperature** (Note 1) ▪ COMPACTED SNOW	OR directional control is noticeably reduced.	
2	**More than 3mm depth of water or slush:** ▪ STANDING WATER ▪ SLUSH	Braking deceleration OR directional control is between Medium and Poor	MEDIUM TO POOR
1	▪ ICE (Note 2)	Braking deceleration is significantly reduced for the wheel braking effort applied OR directional control is significantly reduced.	POOR
0	▪ WET ICE (Note 2) ▪ WATER ON TOP OF COMPACTED SNOW (Note 2) ▪ DRY SNOW or WET SNOW ON TOP OF ICE (Note 2)	Braking deceleration is minimal to nonexistent for the wheel braking effort applied OR directional control is uncertain.	LESS THAN POOR
Note 1: Runway surface temperature should preferably be used where available.			
Note 2: The airport operator may assign a higher runway condition code (but no higher than code 3) for each third of the runway.			

Downgrading the RWYCC

The RCAM links different runway surface conditions to a RWYCC, representing a similar level of braking capability and lateral control.

The airport operator will consider downgrading the RWYCC, if friction measurement, AIREPs or other observations give evidence that the deceleration or lateral control capability is worse than the RWYCC that was initially determined for the observed runway surface condition.

Airport operators are encouraged to include the phrase “RWYCC DOWNGRADED” into the RCR, to give the crew an indication that deviating from the RCAM was done on purpose and not in error.

Upgrading the RWYCC

The GRF provides a method for upgrading the RWYCC on specially prepared winter runways. However, this method is limited to the following scenario only:

- The observed runway surface condition matches RWYCC 0 or 1; and
- the airport operator has treated the runway to an extent that provides good braking action (RWYCC 5);
- then the airport operator may upgrade the RWYCC to 3.

Airport operators are encouraged to include the phrase “RWYCC UPGRADED” into the RCR, to give the crew an indication that deviating from the RCAM was done on purpose and not in error.

244. What is the Runway Condition Report (RCR).

(Lido General 1.4.9.5)

Runway Condition Report (RCR)

The GRF mandates that airports assess the runway surface condition of all operational runways. A Runway Condition Report (RCR) has to be provided when the runway conditions are not dry. The RCR will be sent to the local ATS provider and to the AIS.

ATS will promulgate the RCR to flight crews via radio, and AIS via SNOWTAM, FICON, AMSCR and ATIS or D-ATIS.

In the RCR, the following elements will be transmitted:

- Runway Condition Code (RWYCC);
- type of runway contamination;
- depth, and coverage for each third of the runway, in the order from the threshold having the lower runway designation number.

Runway Surface Condition Descriptors

The term "Runway Surface Condition Descriptors" means one of the following substances is on the surface of the runway:

Runway Surface Condition Descriptors	Definition
Compacted Snow	Snow that has been compacted into a solid mass such that aeroplane tyres, at operating pressures and loadings, will run on the surface without significant further compaction or rutting of the surface.
Dry Snow	Snow from which a snowball cannot readily be made.
Frost	Ice crystals formed from airborne moisture on a surface whose temperature is at or below freezing; frost differs from ice in that frost crystals grow independently and therefore, have a more granular texture.
Ice	Water that has frozen or compacted snow that has transitioned into ice in cold and dry conditions.
Slippery Wet	A wet runway whose surface friction characteristics for a significant portion of it have been determined to be degraded.
Slush	Snow that is so water-saturated that water will drain from it when a handful is picked up or will splatter if stepped on forcefully.
Specially Prepared Winter Runway	A runway with a dry frozen surface of compacted snow or ice, or both, which has been treated with sand or grit or has been mechanically treated to improve runway friction. Specially prepared winter runways are subject to approval by the respective CAA.
Standing Water	Water of depth greater than 3mm.
Wet Ice	Ice with water on top of it or ice that is melting.
Wet Snow	Snow that contains enough water to be able to make a well compacted, solid snowball, but water will not squeeze out.

Runway Length Considered in the RCR

The runway length considered in the RCR is typically the full length of paved surface between the start of TORA or LDA from one direction to the start of TORA or LDA from the opposite direction, whichever is longer.

However, should a stopway exist at an airport that stretches out beyond the end of the opposite start of TORA or LDA, it is excluded from the scope of the runway surface for which RWYCCs are assigned.

Such stopways will usually see less traffic than the rest of the runway surface and may therefore be subject to more accumulation of contamination. If the condition of the stopway is significantly different from the rest of the runway, the airport operator should report this in the free text comments of the RCR.

Note:	It is important for flight crews to be aware that a displaced landing threshold can significantly reduce the first runway third.

Contaminant Coverage

The RCR will report the contamination coverage in per cent of each third of the length (and width) being used. However, airport operators are advised to focus on the area around the wheel tracks when assessing the coverage.

Contamination is reported only when the coverage exceeds 10%.

Runway contamination affects airplane performance only when the coverage exceeds 25% in at least one third. Between 10% and 25% of contamination coverage the RCR will publish a coverage of 25%, report the actual contamination type and depth, but assign the RWYCC 5.

Validity of an RCR

An RCR has a maximum validity of 8HR. When no new RCR is issued after 8HR, the old RCR is expired and it can be assumed that there is no more significant runway surface condition to be reported.

A new RCR for a given runway will cancel the previously issued RCR for that same runway. New RCR shall be issued whenever there are significant changes or if the airport operator performed a new assessment.

Examples of the Dissemination of the Runway Condition Report

Radiotelephony	ATIS
RUNWAY 25 LEFT SURFACE CONDITION ISSUED AT TIME 1210 RUNWAY CONDITION CODE 2 3 3 **Note:** ATC by default will transmit only the runway condition code of each third of the runway, in order from the operational threshold (TDZ, Mid, End). Type of runway contamination, the depth and the coverage will be transmitted upon request of the crew.	**D-ATIS (Text)** EDDF ARR-ATIS G MET REPORT 221220 EXPECT ILS APPROACH RWYS IN USE 25R 25L RWY COND RWY 25R AT TIME 1210 RWYCC TDZ 2 MID 3 END 3 DEPOSIT TDZ 6 MM SLUSH 25 PCT MID 12 MM WET SNOW 50 PCT END 12 MM WET SNOW 25 PCT TRL 70 [...]
	ATIS (Voice) FRANKFURT ARRIVAL INFORMATION GOLF MET REPORT TIME 1220 EXPECT ILS APPROACH RUNWAYS IN USE 25 RIGHT AND 25 LEFT RUNWAY SURFACE CONDITION RUNWAY 25 RIGHT ISSUED AT TIME 1210, RUNWAY CONDITION CODE, TOUCH DOWN ZONE 2, MID POINT 3, STOPEND 3, DEPOSIT, TOUCH DOWN ZONE 6 MILLIMETERS SLUSH, 25 PERCENT, MID POINT 12 MILLIMETERS WET SNOW, 50 PERCENT, STOPEND 12 MILLIMETERS WET SNOW, 25 PERCENT TRANSITION LEVEL 70 [...]
	The runway condition report on the ATIS/D-ATIS will be abbreviated if the values for all of the runway sections are the same: **SNOWTAM Format** 02171210 07L 3/3/3 100/100/100 06/06/06 SLUSH/SLUSH/SLUSH **D-ATIS Format** RWY COND RWY 25R AT TIME 1210 RWYCC TDZ 3 MID 3 END 3 DEPOSIT TOTAL RWY 6 MM SLUSH 100 PCT

245. What is purpose of “CABIN SECURE” ?

(CCM 4.2.2.3)

Cabin Emergency Preparations

Secure Cabin

While CIC briefs passengers, the other cabin crew shall carry out the following:

1. cabin crew in charge of galleys shall start securing respective galleys
2. cabin crew handling trolleys shall secure them either in stowage or toilet, depending on time availability
3. other cabin crew shall check all passengers following the announcement and quickly check their duties
4. after securing passengers, cabin and galleys, cabin crew store hard objects in toilets and secure toilet doors by sliding toilet sign to OCCUPIED
5. if time permits:
   a. select and reseat able-bodied passengers. Brief the instruction on exit operation, slide/raft detaching and other specific duties
   b. in case of ditching or landing in remote area, prepare to take the Emergency Locator Transmitter (ELT) and suitable survival equipment. Food and drinks should be put into bags or blankets.
6. report "CABIN SECURE" to the P-i-C that cabin is secured. Check again with P-i-C which exits can or cannot be used for evacuation.

246. What is the phase that P-I-C use when make a PA during rapid disembarkation ?

(CCM 4.9)

Rapid Disembarkation

Procedures

In the event of a situation which warrants the evacuation of the aircraft, the P-i-C will first determine the immediacy of the threat and then decide on the most appropriate course of action be it an Emergency Evacuation or a Rapid Disembarkation. In certain circumstances, the P-i-C is responsible for determining the most appropriate course of action, initiating that action and broadcasting the intended actions to ATC with a request for any needed external assistance.

1. P-i-C makes PA to initiate rapid disembarkation by using the phrase "ATTENTION CABIN CREW, CLEAR THE AIRCRAFT IMMEDIATELY".
2. Upon hearing the execution phrase for rapid disembarkation, CIC will make PA to advise the on-board passengers of the need for immediate disembarkation. The announcement will include the following instructions:
   - disembark at designated EXIT immediately
   - leave all stowed belongings on board
   - in case of BOMB THREAT, passengers are advised to bring their belongings with them; the left behind items will be under EOD investigation
   - refrain from smoking and using mobile phone
   - further information will be given at terminal.

3. Cabin crew then will reinforce the PA and make every attempt to ensure that passengers disembark as quickly as possible.
4. The assigned cabin crew may marshal passenger to the terminal when in absence of ground personal.
5. All crew leave the aircraft after ensuring no passenger left on board.

247. After PIC make urgency call to CIC during emergency situation, PIC must brief "TESTS" to CIC. What is "TESTS" means ?
(CCM 4.2.2.2)

P-i-C's Briefing to CIC
P-i-C must brief the CIC the following information (TESTS):
1. **T**ype of emergency (Landing at terminal or at remote area or Ditching)
2. **E**vacuation necessity
3. **S**ignal to brace and to evacuate
4. **T**ime available (Synchronize watch)
5. **S**pecial instruction (any exit blocked, fire etc.).

248. What is procedure of "flight deck service" ?
(CCM 2.33)

Flight Deck Service
To prevent the remote possibility of both pilots being incapacitated at the same time, it is recommended that the P-i-C and other flight crew not eat the same meal and avoid certain types of foods that are particularly liable to cause gastrointestinal symptoms (e.g., shellfish, crustaceans, etc.).

The following are guidelines to be considered for offering meal/beverage service to the flight deck:
- meal trays/meals should be kept in their assigned location in the galley until the food is required for consumption
- the P-i-C and the co-pilot should not be served at the same time;
- beverages should be served separately from the meal tray to avoid spillage
- drinks and meal trays should be handed directly to the pilots and not left unattended in the flight deck
- drinks should not be passed over the central pedestal area to avoid spillage and consequential damage to electronics
- drinks should be served via the window side; to the P-i-C from left side and co-pilot from the right side
- alcoholic beverages must not be served or consumed in the flight deck
- all catering items should be removed from the flight deck before takeoff and landing and cleared during the flight as necessary.

249. Who is "LIAISON" ?

(CCM 2.32)

Flight Crew and Cabin Crew Liaison

The CIC; who has the assigned crew station closest to the flight deck, has the responsibility to communicate with the P-i-C for normal operations and during abnormal and emergency procedures. Such communication should extend until after the aircraft has arrived at its final destination where, for instance, cabin safety equipment defects may need to be attended to.

One cabin crew is required on the 747-400 upper deck during taxi, takeoff, and landing. This cabin crew should be responsible for communicating with the P-i-C in the event of any emergency on takeoff or landing. And during emergency evacuation procedures on 747-400, the CIC should remain at his or her station to control and operate the emergency exits.

250. What need to be done when correcting entry in Aircraft Log ?

(OM-A 14.3.1)

Aircraft Log Books

(The following instructions and handling procedures are summarized from TTPM–LO 1201.)

General

Aircraft Log Books are composed of Technical Log and Cabin Log. Crews are responsible for reporting or advising any aircraft discrepancy occurred during their flight operations in Aircraft Log Books.

All entries shall be written in capital letters and in English only.
Black or blue ballpoint pen is recommended; always applies considerable pressure on writing for the copied layers.

Abbreviations that are not self-explanatory and commonly used shall be avoided.
Any error made during writing on the Aircraft Log, the mistake shall be crossed out by one diagonal line and signed by the writer with his/her ID No./AUTH No. under the diagonal line. Any kind of eraser is not allowed.

PBN (Performance-Based Navigation)

251. Aircraft operation in each RNP airspace shall be equipped with RNAV equipment. what's RNP certified for your aircraft type ?

(OM-A 16.1.2)

PBN: List of Authorized Aircraft for Special Approval PBN

Aircraft Type	RNAV 1	RNAV 2	RNAV 5	RNAV 10	RNP 1	RNP 2	RNP 4	RNP APCH (LNAV)	RNP APCH (LNAV, VNAV)
777-300ER	✓	✓	✓	✓	✓	✓	✓	✓	✓
787-8	✓	✓	✓	✓	✓	✓	✓	✓	✓
787-9	✓	✓	✓	✓	✓	✓	✓	✓	✓
A350-900	✓	✓	✓	✓	✓	✓	✓	✓	✓

252. How different between RNAV and RNP ?

(OM-A 16.4.1.4)

RNAV AND RNP

RNP operations can be identified by the capability of the on-board navigation system to monitor in real time the achieved navigation performance and to alert the operating crew when the specified minimum performance appropriate to a particular operation could not be met. This additional functionality provided by RNP allows the flight crew to intervene and to take appropriate mitigating action (e.g. a go-round), there by allowing RNP operations to provide an additional level of safety and capability over RNAV operations.

RNP = RNAV+ On Board Performance Monitoring and Alerting

Major differences between RNAV & RNP:

RNAV applications assume aircraft ops on any desired flight path in the coverage of Station-reference NAVAIDS or within limits of the capability of self-contained aids, or a combination of systems

RNP applications are RNAV application with additional requirement of: On-Board Performance Monitoring & Alerting

As GNSS systems incorporate performance monitoring and alerting, the distinction between RNAV and RNP operations in practice is the requirement for GNSS. While there are exceptions to this rule, in simple terms RNP operations are GNSS based, and for RNAV operations are based on older technology.

RNAV navigation specifications have been developed to support existing capability in aircraft equipped with systems which in the general case were not designed to provide on-board performance monitoring and alerting.

RNP navigation specifications have been developed from a need to support operations that depend upon GNSS to provide the required performance.

253. How does FMS calculate aircraft position ?

(OM-A 8.3.2.3)

Area Navigation (PBN/RNAV/RNP)
Refer to RM/GEN/NAV and THAI PBN Manual.

Navigation is from “point-to-point”, the aircraft position being determined by the on board navigation system using the information from several navigation aids such as VOR/DME or DME/DME or GNSS (GPS). The combination of inertial reference system (IRS) and above position sensors and calculation through the FMS/FMC allows achieving different RNP.

Flight Management System (FMS) and Area Navigation System (RNAV)
Aircraft equipped with FMS or RNAV are authorized to use these systems for en route and terminal area navigation in accordance with respective FCOM. Functioning FMS/RNAV is a requirement for navigating along ATS routes based on area navigation.

The navigation computer is NAVAID updated when signals from at least two DME’s or one VOR/DME are available. In aircraft equipped with Inertial Reference Systems (IRS) the navigation computer is primarily NAVAID updated, but outside VHF-NAV range the computer will be updated by the IRS.

The VHF-NAV may be used in accordance with FCOM for cross-checking FMS/RNAV performance without checking and monitoring the identification signal as required.
If the FMS/RNAV is NAVAID updated it may be used for navigation to maintain terrain clearance and to comply with OM-A requirements for check of correct position.
Aircraft equipped with IRS may use FMS/RNAV for en route navigation without NAVAID update, if the progress of the flight is verified by means of other NAVAID.

When the failure or degradation is detected before departure the aircraft is permitted to make one flight to an aerodrome where repair can be made. BKKOW or responsible office will provide crew with a new Company flight plan and file an ATS plan via a VOR/DME/NDB defined routing.
If no RNAV equipment are installed the phase “Negative-RNAV” shall be included by the pilot immediately following the aircraft callsign whenever initial contact on an air traffic control frequency is established.

In case a B-RNAV equipped aircraft experience failure or degradation of the B-RNAV system, the aircraft is permitted to proceed if able to continue operations in accordance with the current ATC clearance. If unable, a revised clearance shall be obtained from ATC .

254. What is RNP ?

(OM-A 16.4)

RNAV AND RNP

RNP operations can be identified by the capability of the on-board navigation system to monitor in real time the achieved navigation performance and to alert the operating crew when the specified minimum performance appropriate to a particular operation could not be met. This additional functionality provided by RNP allows the flight crew to intervene and to take appropriate mitigating action (e.g. a go-round), thereby allowing RNP operations to provide an additional level of safety and capability over RNAV operations.

RNP = RNAV+ On Board Performance Monitoring and Alerting

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RNAV applications assume aircraft ops on any desired flight path in the coverage of Station-reference NAVAIDS or within limits of the capability of self-contained aids, or a combination of systems

RNP applications are RNAV application with additional requirement of: On-Board Performance **Monitoring & Alerting**

As GNSS systems incorporate performance monitoring and alerting, the distinction between RNAV and RNP operations in practice is the requirement for GNSS. While there are exceptions to this rule, in simple terms RNP operations are GNSS based, and for RNAV operations are based on older technology.

RNAV navigation specifications have been developed to support existing capability in aircraft equipped with systems which in the general case were not designed to provide on-board performance monitoring and alerting.

RNP navigation specifications have been developed from a need to support operations that depend upon GNSS to provide the required performance.

255. What is RNAV system ? (PBN Manual 4th Edition-2013) and what is the benefit of using RNP/RNAV ?

(PBN Manual 4th edition, RM 1.6.6.2.3)

PBN Manual 4th edition Volume I EXPLANATION OF TERMS

RNAV system. A navigation system which permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these. An RNAV system may be included as part of a flight management system (FMS).

RM 1.6.6.2.3. PBN Advantages

PBN offers a number of advantages over the sensor-specific method of developing airspace and obstacle clearance criteria:

a) reduces the need to maintain sensor-specific routes and procedures, and their associated costs. For example, moving a single VOR ground facility can impact dozens of procedures, as VOR can be used on routes, VOR approaches, missed approaches, etc.. Adding new sensor-specific procedures will compound this cost, and the rapid growth in available navigation systems would soon make sensor-specific routes and procedures unaffordable;

b) avoids the need for development of sensor-specific operations with each new evolution of navigation systems, which would be cost-prohibitive. The expansion of satellite navigation services is expected to contribute to the continued diversity of RNAV and RNP systems in different ACFT. The original Basic GNSS equipment is evolving due to the development of augmentations such as SBAS, GBAS and GRAS, while the introduction of Galileo and the modernization of GPS and GLONASS will further improve GNSS performance. The use of GNSS/inertial integration is also expanding;

c) allows for more efficient use of airspace (route placement, fuel efficiency, noise abatement, etc.)

d) clarifies the way in which RNAV and RNP systems are used; and

e) facilitates the operational approval process for operators by providing a limited set of navigation specifications intended for global use.

256. What is the lateral separation between two airways on adjacent RNP-10 AWYs ?

(RM 1.5.2.12.6.1.2)

RM 1.5.2.12.6.1.2. Lateral Separation Criteria and Minima

Means by which lateral separation may be applied include the following:

RNAV Operations Where RNP is Specified on Parallel Tracks or ATS Routes

Within designated airspace or on designated routes, where RNP is specified, lateral separation between RNAV-equipped aircraft may be obtained by requiring aircraft to be established on the center lines of parallel tracks or ATS routes spaced at a distance which ensures that the protected airspace of the tracks or ATS routes does not overlap.

Lateral Separation of Aircraft on Parallel or Non-intersecting Tracks or ATS Routes

Minimum Spacing Between Tracks		Performance Requirements			Additional Requirements
Airspace where SLOP is not authorized, or is only authorized up to 0.5NM	**Airspace where SLOP up to 2NM is authorized**	**Navigation**	**Communication**	**Surveillance**	
93km (50NM)	93km (50NM)	RNAV 10 (RNP 10) RNP 4 RNP 2	Types of communication other than direct controller-pilot VHF voice		

257. Which RNP types are implemented for En Route NAV over continental areas, en-route oceanic NAV or continental area outside radio navaid coverage ? (RM 1.6.6.2.7.2)

Application of Navigation Specification by Flight Phase

Navigation Specification	Flight Phase							
	En route Oceanic / Remote	En route Continental	Arrival	Approach				DEP
				Initial	Inter-mediate	Final	Missed (1)	
RNAV 10	10							
RNAV 5 (2)		5	5					
RNAV 2		2	2					2
RNAV 1		1	1	1	1		1	1
RNP 4	4							
RNP 2	2	2						
RNP 1 (3)			1	1	1		1	1
Advanced RNP (A-RNP) (4)	2 (5)	2 or 1	1	1	1	0.3	1	1
RNP APCH (6)				1	1	0.3 (7)	1	
RNP AR APCH				1 - 0.1	1 - 0.1	0.3 - 0.1	1 - 0.1	
RNP 0.3 (8)		0.3	0.3	0.3	0.3		0.3	0.3

Notes:

(1) Only applies once 50m obstacle clearance has been achieved after the start of climb.

(2) RNAV 5 is an en route navigation specification which may be used for the initial part of a STAR outside 30NM and above MSA.

(3) The RNP 1 specification is limited to use on STARs, SIDs, the initial and intermediate segments of IAPs and the missed approach after the initial climb phase. Beyond 30NM from the ARP, the accuracy value for alerting becomes 2NM.

(4) A-RNP also permits a range of scalable RNP lateral navigation accuracies.

(5) Optional — requires higher continuity.

(6) There are two options to the RNP APCH specification, both of which are classified RNP APCH in accordance with the PBN concept.

- **Option A: GNSS and BARO-VNAV**

  These RNP approaches give access to minima, designated as LNAV or LNAV/VNAV. Such RNP APCH procedures include existing RNAV (GNSS) approach procedures designed with a straight segment. While similar in functional requirements, there are slight differences between the two sets of airworthiness criteria.

- **Option B: SBAS**

  These RNP approaches give access to minima designated as LP and LPV. While SBAS is one means of compliance, other GNSS systems providing either lateral and/or vertical guidance performance, may also be used to support RNP APCH down to LP or LPV minima, when employed in accordance with the provisions in this navigation specification. An RNP APCH down to LPV minimum may give access to a different range of minima, depending on the performance of the navigation systems and the assessment of the responsible airspace authority. The provisions given in this navigation specification are consistent with these different sets of LPV minima, down to 200ft.

RNP APCH procedures, down to LNAV, LNAV/VNAV minima or LP, LPV minima are authorized by a number of regulatory agencies including EASA and FAA. In order to achieve a global standard, the two sets of criteria were harmonized by ICAO into a single navigation standard.

(7) RNP 0.3 is applicable to RNP APCH Option A. Different angular performance requirements are applicable to RNP APCH of this option only.
(8) The RNP 0.3 specification is primarily intended for helicopter operations.

Note: When originally published, this navigation specification included the prefix "basic" because an Advanced RNP 1 specification was planned. Advanced RNP 1 evolved into the A-RNP specification, so the need to include the prefix "Basic" is no longer necessary. Existing approvals granted under the original nomenclature remain valid.

258. What is a different between RNAV and RNP spec ?

(FROM DOC 9613_PBN Manual I-(v) [4th edition_2013])

PBN terminology

RNAV and RNP systems are fundamentally similar. The key difference between them is the requirement for on-board performance monitoring and alerting. A navigation specification that includes a requirement for on-board navigation performance monitoring and alerting is referred to as an RNP specification. One not having such requirements is referred to as an RNAV specification. An area navigation system capable of achieving the performance requirement of an RNP specification is referred to as an RNP system.

259. What is on-board performance monitoring and alerting system ?

(FROM DOC 9613_PBN MANUAL II-A-2-3)

ROLE OF ON-BOARD PERFORMANCE MONITORING AND ALERTING

On-board performance monitoring and alerting capabilities fulfill two needs, one on board the aircraft and one within the airspace design. The assurance of airborne system performance is implicit for RNAV operations. Based upon existing airworthiness criteria, RNAV systems are only required to demonstrate intended function and performance using explicit requirements that are broadly interpreted. The result is that while the nominal RNAV system performance can be very good, it is characterized by the variability of the system functionality and related flight performance. RNP systems provide a means to minimize variability and assure reliable, repeatable and predictable flight operations.

On-board performance monitoring and alerting allow the air crew to detect whether or not the RNP system satisfies the navigation performance required in the navigation specification. On-board performance monitoring and alerting relate to both lateral and longitudinal navigation performance.

On-board performance monitoring and alerting is concerned with the performance of the area navigation system.

- "on-board" explicitly means that the performance monitoring and alerting is effected on board the aircraft and not elsewhere, e.g. using a ground-based route adherence monitor or ATS surveillance. The monitoring element of on-board performance monitoring and alerting relates to FTE and NSE. PDE is constrained through database integrity and functional requirements on the defined path, and is considered negligible.
- "monitoring" refers to the monitoring of the aircraft's performance as regards its ability to determine positioning error and/or to follow the desired path.
- "alerting" relates to monitoring: if the aircraft's navigation system does not perform well enough, this will be alerted to the air crew.

260. Does RNP10 require on-board monitoring and alerting ?

(FROM DOC 9613_PBN MANUAL I-A-1-6)

Accommodating inconsistent RNP designations

The existing RNP 10 designation is inconsistent with PBN RNP and RNAV specifications. RNP 10 does not include requirements for on-board performance monitoring and alerting. For purposes of consistency with the PBN concept, RNP 10 is referred to as RNAV 10 in this manual. Renaming current RNP 10 routes, operational approvals, etc., to an RNAV 10 designation would be an extensive and expensive task, which is not cost-effective. Consequently, any existing or new operational approvals will continue to be designated RNP 10, and any charting annotations will be depicted as RNP 10 (see Figure I-A-1-3).

261. What type of NAV specifications support oceanic/remote area ?

(FROM DOC 9613_PBN MANUAL I-A-2-3)

Oceanic and remote continental

Oceanic and remote continental airspace concepts are currently supported by three navigation applications, RNAV10, RNP4 and RNP2.

262. What type of NAV specifications support continental en-route airspace ?

(FROM DOC 9613_PBN MANUAL I-A-2-3)

Continental en route

Continental en-route airspace concepts are supported by RNAV5, RNAV2 and RNP2 applications.

Continental en-route airspace concepts are currently supported by RNAV and RNP applications. RNAV 5 is used in the Middle East (MID), South American (SAM) and European (EUR) Regions but as of the publication date of this manual, it is designated as B-RNAV (Basic RNAV in Europe and RNP 5 in the Middle East (see 1.2.5.5). In the United States, an

RNAV 2 application supports an en-route continental airspace concept. At present, continental RNAV applications support airspace concepts which include radar surveillance and DCPC (voice). Within the next few years, en-route A-RNP operations are expected in Europe whilst RNP 0.3 operations for helicopters and slow moving aircraft are expected in the United States

263. What type of NAV specification support arrival and departure in terminal airspace ?

(FROM DOC 9613_PBN MANUAL I-A-2-4)

Terminal airspace: arrival and departure

Existing terminal airspace concepts, which include arrival and departure, are supported by RNAV and RNP applications; RNAV1 and RNP1.

Existing terminal airspace concepts, which include arrival and departure, are supported by RNAV applications and RNP used in the European (EUR) Region, the United States and, increasingly, elsewhere. The European terminal airspace RNAV application is known as P-RNAV (Precision RNAV) though this is expected to migrate to A-RNP. As shown in Volume II, although the RNAV 1 specification shares a common navigation accuracy with P-RNAV, this regional navigation specification does not satisfy the full requirements of the RNAV 1 specification shown in Volume II. As of the publication of this manual, the United States terminal airspace application formerly known as US RNAV Type B has been aligned with the PBN concept and is now called RNAV 1. RNP 1 has been developed primarily for application in non-radar, low-density terminal airspace. In future, more RNP applications are expected to be developed for both en-route and terminal airspace

264. What type of NAV specification support approach concepts ?

(RM 1.6.6.4.1.4)

Approach

Approach concepts cover all segments of the instrument approach, i.e. initial, intermediate, final and missed approach. These include RNP specifications requiring a navigation accuracy of 0.3NM to 0.1NM or lower. Typically, three sorts of RNP applications are characteristic of this phase of flight: new procedures to RWYs never served by an instrument procedure, procedures either replacing or serving as back-up to existing instrument procedures based on different technologies, and procedures developed to enhance airport access in demanding environments.

The relevant RNP specifications are RNP APCH and RNP AR APCH as well as A-RNP.

265. Describe RNP10 ?

(OM-A 16.4)

RNAV 10 or RNP 10

General

RNP 10 was developed and implemented at a time when the delineation between RNAV and RNP had not been clearly defined. As the requirements for RNP 10 did not include a requirement for on-board performance monitoring and alerting, it is more correctly described as an RNAV operation and hence the inclusion in the PBN Manual as RNAV 10.

Recognizing that airspace, routes, airworthiness and operational approvals have been designated as RNP 10, further declaration of airspace, routes, and aircraft may continue to use the term RNP 10, while the PBN Manual application will be known as RNAV 10.

The minimum route spacing where RNAV 10 is utilized is 50 NM.

RNAV 10 requires that aircraft operating in oceanic and remote areas be equipped with at least two independent and serviceable LRNSs comprising an INS, an IRS FMS or a GNSS, with integrity such that the navigation system does not provide an unacceptable probability of misleading information.

NOTE : The details of LRNS equipment and time limit can be found in MEL of the respective aircraft type.

NAVAID infrastructure

RNAV 10 was developed for operation in oceanic and remote areas and does not require any ground-based NAVAID infrastructure or assessment.

266. Describe RNAV5 ?

(OM-A 16.4)

RNAV 5

General

RNAV 5 is used in the Middle East (MID), South American (SAM) and European (EUR) Regions but as of the publication date of this manual, it is designated as B-RNAV (Basic RNAV in Europe and RNP 5 in the Middle East.

RNAV 5 is intended for en-route navigation where there is adequate coverage of ground-based radio navigation aids permitting DME/DME or VOR/DME area navigation operations.

NAVAID infrastructure

RNAV 5 operations are based on the use of RNAV equipment, which automatically determines the aircraft position in the horizontal plane using input from one or a combination of the following types of position sensors, together with the means to establish and follow a desired path:

a) VOR/DME;

b) DME/DME;

c) INS or IRS; and

d) GNSS.

267. Describe RNAV1 ?

(OM-A 16.4)

RNAV 1 AND RNAV 2

General

RNAV 1 and 2 navigation specifications constitute harmonization between European Precision RNAV (P-RNAV) and United States RNAV (US-RNAV) criteria.

The RNAV 1 and RNAV 2 navigation specification applies to:
All ATS routes, including those established in the en-route domain;
Standard instrument departures and arrivals (SID/STAR); and
Instrument approach procedures up to the final approach fix (FAF)/final approach point (FAP).
The RNAV 1 and 2 specification is primarily developed for RNAV operations in a radar environment

NAVAID infrastructure

RNAV 1 and RNAV 2 operations are based upon the use of RNAV equipment that automatically determines the aircraft position in the horizontal plane using input from the following types of position sensors (no specific priority):

a) GNSS

b) DME/DME

c) DME/DME/IRU

268. Describe RNAV2 ?

(OM-A 16.4)

RNAV 1 AND RNAV 2

General

RNAV 1 and 2 navigation specifications constitute harmonization between European Precision RNAV (P-RNAV) and United States RNAV (US-RNAV) criteria.

The RNAV 1 and RNAV 2 navigation specification applies to:
All ATS routes, including those established in the en-route domain;

Standard instrument departures and arrivals (SID/STAR); and

Instrument approach procedures up to the final approach fix (FAF)/final approach point (FAP).

The RNAV 1 and 2 specification is primarily developed for RNAV operations in a radar environment

NAVAID infrastructure

RNAV 1 and RNAV 2 operations are based upon the use of RNAV equipment that automatically determines the aircraft position in the horizontal plane using input from the following types of position sensors (no specific priority):

a) GNSS

b) DME/DME

c) DME/DME/IRU

269. Describe RNP 4 ?

(OM-A 16.4)

RNP 4

General

RNP 4 is a navigation specification applicable to oceanic and remote airspace, and supports 30NM lateral and 30NM longitudinal separation.

Note : An existing application of 30 NM lateral and 30 NM longitudinal separation minimum requires a communications capability of DCPC or CPDLC and an ATS surveillance capability by an ADS system in which an event contract must be set that includes a lateral deviation event report whenever a deviation from track center line greater than 9.3 km (5 NM) occurs.

RNP4 requires at least two fully serviceable independent LRNSs, with integrity such that the navigation system does not provide misleading information.

Note : The details of LRNS equipment can be found in MEL of the respective aircraft type.

NAVAID infrastructure

RNP 4 was developed for operations in oceanic and remote airspace; therefore, it does not require any ground-based NAVAID infrastructure. GNSS is the primary navigation sensor to support RNP 4.

270. Describe RNP 2 ?

(OM-A 16.4, 2.7)

RNP 2

General

RNP 2 is primarily intended for a diverse set of en-route applications, particularly in geographic areas with little or no ground NAVAID infrastructure, limited or no ATS surveillance, and low to medium density traffic. Use of RNP 2 in continental applications requires a lower continuity requirement than used in oceanic/remote applications. In the latter application, the target traffic is primarily transport category aircraft operating at high altitude, whereas, continental applications may include a significant percentage of GA aircraft.

RNP 2 can be associated with FRT (Fixed Radius Transition)

NAVAID infrastructure

The RNP 2 specification is based upon GNSS.

271. Describe RNP 1 ?

(OM-A 16.4)

RNP 1

General

The RNP 1 was developed for connectivity between the en-route structure and terminal airspace with no or limited ATS surveillance, with low to medium density traffic.

NAVAID infrastructure

The RNP 1 specification is based upon GNSS. While DME/DME-based RNAV systems are capable of RNP 1 accuracy, this navigation specification is primarily intended for environments where the DME infrastructure cannot support DME/DME area navigation to the required performance.

Note : *For RNP procedures, the RNP system may only use DME updating when authorized by the State.*

272. Why there is no NAV accuracy value for RNP APCH ?

(RM 1.6.6.2.7)

Oceanic, Remote Continental, En route, Terminal and Approach Operations

For oceanic, remote, en route and terminal operations, an RNP specification is designated as RNP X, e.g. RNP 4. An RNAV specification is designated as RNAV X, e.g. RNAV 1. If two navigation specifications share the same value for X, they may be distinguished by use of a prefix. Where a navigation specification covers various phases of flight and permits different lateral navigation accuracy in nautical miles in various flight phases, a prefix is used, without a suffix; e.g. A-RNP. For both RNP and RNAV designations, the expression "X" (where stated) refers to the lateral navigation accuracy (expressed as TSE) in nautical miles, which is expected to be achieved at least 95 per cent of the flight time by the population of ACFT operating within the airspace, route or procedure. Approach navigation specifications cover all segments of the instrument approach. RNP specifications are designated using RNP as a prefix and an abbreviated textual suffix, e.g. RNP APCH or RNP AR APCH. There are no RNAV approach specifications.

Note: Each navigation for RNP and RNAV as well as each accuracy requirement have to be approved separately and independently. RNP or RNAV specification having a high accuracy requirement (e.g. RNP 0.3) are not automatically approved for a navigation specification having a lower accuracy requirement (e.g. RNP 1.0).

273. APV BARO-NAV (or VNAV approach) provides both lateral and vertical guidance. Why is it defined as a non-precision approach ?

(RM 1.6.2.1.10.2 and RM 1.6.6.1)

RNP Approaches with LNAV and VNAV Guidance

LNAV/VNAV identifies an Approach Procedure with Vertical Guidance (APV). This approach type leads to minima developed to accommodate an RNP approach procedure with lateral and vertical guidance, usually provided for approaches with a certified baro-VNAV system. Lateral and vertical integrity limits are less restrictive than for precision approach or LPV. SBAS is to be used optionally for lateral navigation.

Terminology and Explanation of Terms

Approach Procedure with Vertical Guidance (APV)

An instrument procedure which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations.

Note : The Performance-Based Navigation (PBN) Manual (ICAO Doc 9613), Volume II, contains detailed guidance on navigation specifications.

274. During RNP APCH, when do we have to make a missed-approach ?

(FROM PBN MANUAL II-C-5-13 (4th Edition))

(FROM PBN MANUAL II-C-5-13 (4th Edition))

During the procedure

During the RNP APCH procedure, pilots must use a lateral deviation indicator, flight director and/or autopilot in lateral navigation mode. Pilots of aircraft with a lateral deviation indicator (e.g. CDI) must ensure that lateral deviation indicator scaling (full-scale deflection) is suitable for the navigation accuracy associated with the various segments of the procedure (i.e. ±1.0 NM for the initial and intermediate segments, ±0.3 NM for the FAS down to LNAV or LNAV/VNAV minima, and ±1.0 NM for the missed approach segment). All pilots are expected to maintain procedure centre lines, as depicted by on-board lateral deviation indicators and/or flight guidance during the whole approach procedure, unless authorized to deviate by ATC or under emergency conditions. For normal operations, cross-track error/deviation (the difference between the RNP system computed path and the aircraft position relative to the path) should be limited to ±1⁄2 the navigation accuracy associated with the procedure (i.e. 0.5 NM for the initial and intermediate segments, 0.15 NM for the FAS, and 0.5 NM for the missed approach segment). Brief deviations from this standard (e.g. overshoots or undershoots) during and immediately after turns, up to a maximum of one-times the navigation accuracy (i.e. 1.0 NM for the initial and intermediate segments), are allowable.

Note: Some aircraft do not display or compute a path during turns, but are still expected to satisfy the above standard during intercepts following turns and on straight segments.

When Barometric VNAV is used for vertical path guidance during the FAS, deviations above and below the Barometric VNAV path must not exceed +22 m/–22 m (+75 ft/–75 ft), respectively.

Pilots must execute a missed approach if the lateral deviations or vertical deviations, if provided, exceed the criteria above, unless the pilot has in sight the visual references required to continue the approach.

275. What is a limitation of cross-track error/deviation for PBN applications ?

(PBN MANUAL II-C-5-13 (4th Edition))

During the procedure

During the RNP APCH procedure, pilots must use a lateral deviation indicator, flight director and/or autopilot in lateral navigation mode. Pilots of aircraft with a lateral deviation indicator (e.g. CDI) must ensure that lateral deviation indicator scaling (full-scale deflection) is suitable for the navigation accuracy associated with the various segments of the procedure (i.e. ±1.0 NM for the initial and intermediate segments, ±0.3 NM for the FAS down to LNAV or LNAV/VNAV minima, and ±1.0 NM for the missed approach segment). All pilots are expected to maintain procedure centre lines, as depicted by on-board lateral deviation indicators and/or flight guidance during the whole approach procedure, unless authorized to deviate by ATC or under emergency conditions. For normal operations, cross-track error/deviation (the difference between the RNP system computed path and the aircraft position relative to the path) should be limited to ±1⁄2 the navigation accuracy associated with the procedure (i.e. 0.5 NM for the initial and intermediate segments, 0.15 NM for the FAS, and 0.5 NM for the missed approach segment). Brief deviations from this standard (e.g.

overshoots or undershoots) during and immediately after turns, up to a maximum of one-times the navigation accuracy (i.e. 1.0 NM for the initial and intermediate segments), are allowable.

Note : *— Some aircraft do not display or compute a path during turns, but are still expected to satisfy the above standard during intercepts following turns and on straight segments.*

276. When do "PBN CONTINGENCY PROCEDURES" need to be performed ?

(PBN MANUAL II-C-5-13 (4th Edition))

(PBN MANUAL II-C-5-13 (4th Edition))

Contingency procedures

The pilot must notify ATC of any loss of the RNP APCH capability, together with the proposed course of action. If unable to comply with the requirements of an RNP APCH procedure, pilots must advise ATS as soon as possible. The loss of RNP APCH capability includes any failure or event causing the aircraft to no longer satisfy the RNP APCH requirements of the procedure. The operator should develop contingency procedures in order to react safely following the loss of the RNP APCH capability during the approach.

In the event of communications failure, the pilot must continue with the RNP APCH in accordance with the published lost communications procedure.

277. What is a "PBN contingency procedures" in Oceanic/Remote airspace ?

(RM 1.5.2.17.4.1)

Special Procedures for In-Flight Contingencies in Oceanic Airspace
(ICAO Doc 4444)

Although all possible contingencies cannot be covered, the following procedures provide for the more frequent cases such as:

a) the inability to comply with assigned clearance due to meteorological conditions;

b) en-route diversion across the prevailing traffic flow (for example, due to medical emergencies); and

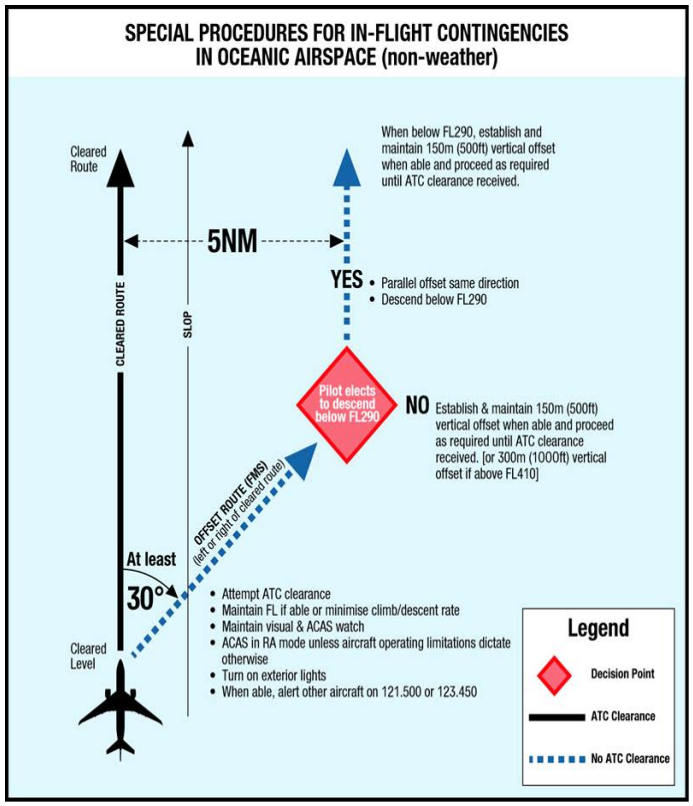
c) the loss of, or significant reduction in, the required navigation capability when operating in an airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations, or pressurization failure.

The pilot shall take action as necessary to ensure the safety of the aircraft, and the pilot's judgment shall determine the sequence of actions to be taken, having regard to the prevailing circumstances. Air traffic control shall render all possible assistance.

General Procedures

If an aircraft is unable to continue the flight in accordance with its ATC clearance, a revised clearance shall be obtained, whenever possible, prior to initiating any action.

If prior clearance cannot be obtained, the following contingency procedures should be employed until a revised clearance is received. In general terms, the aircraft should be flown at an offset level and on an offset track where other aircraft are less likely to be encountered.



a) Leave the cleared track or ATS route by initially turning at least 30 degrees to the right or to the left, in order to establish and maintain a parallel, same direction track or ATS route offset 5NM (9.3km). The direction of the turn should be based on one or more of the following factors:
- aircraft position relative to any organized track or ATS route system;
- the direction of flights and flight levels allocated on adjacent tracks;
- the direction to an alternate airport;
- any strategic lateral offset being flown, and
- terrain clearance.

b) maintain a watch for conflicting traffic both visually and by reference to ACAS (if equipped) leaving ACAS in RA mode at all times, unless aircraft operating limitations dictate otherwise;

c) turn on all aircraft exterior lights (commensurate with appropriate operating limitations);

d) keep the SSR transponder on at all times and, when able, squawk 7700, as appropriate and, if equipped with ADS-B or ADS-C, select the appropriate emergency functionality;

e) as soon as practicable, the pilot shall advise air traffic control of any deviation from their assigned clearance;

f) use means as appropriate (i.e. voice and/or CPDLC) to communicate during a contingency or emergency;

g) if voice communication is used, the radiotelephony distress signal (MAYDAY) or urgency signal (PAN PAN) preferably spoken three times, shall be used, as appropriate;

h) when emergency situations are communicated via CPDLC, the controller may respond via CPDLC. However, the controller may also attempt to make voice communication contact with the aircraft;

I) establish communications with and alert nearby aircraft by broadcasting on the frequencies in use and at suitable intervals on 121.500 (or, as a backup, on the inter-pilot air-to-air frequency 123.450): aircraft identification, the nature of the distress condition, intention of the PIC, position (including the ATS route designator or the track code, as appropriate) and flight level; and

j) the controller should attempt to determine the nature of the emergency and ascertain any assistance that may be required. Subsequent ATC action with respect to that aircraft shall be based on the intentions of the pilot and overall traffic situation.

Actions to be Taken once Offset from Track

The pilot's judgement of the situation and the need to ensure the safety of the aircraft will determine the actions outlined to be taken. Factors for the pilot to consider when deviating from the cleared track or ATS route or level without an ATC clearance include, but are not limited to:

a) operation within a parallel track system;

b) the potential for User Preferred Routes (UPRs) parallel to the aircraft's track or route;

c) the nature of the contingency (e.g. aircraft system malfunction) and;

d) weather factors (e.g. convective weather at lower flight levels).

If possible maintain the assigned flight level until established on the 9.3km (5NM) parallel, same direction track or ATS route offset. If unable, initially minimize the rate of descent to the extent that is operationally feasible.

Once established on a parallel, same direction track or route offset by 9.3km (5NM), either:

a) descend below FL290, and establish a 150m (500ft) vertical offset from those flight levels normally used, and proceed as required by the operational situation or if an ATC clearance has been obtained, in accordance with the clearance; or

Note: Descent below FL290 is considered particularly applicable to operations where there is a predominant traffic flow (e.g. east-west) or parallel track system where the aircraft's diversion path will likely cross adjacent tracks or ATS routes. A descent below FL290 can decrease the likelihood of conflict with other aircraft, ACAS RA events and delays in obtaining a revised ATC clearance.

b) establish a 150m (500ft) vertical offset (or 300m (1000ft) vertical offset if above FL410) from those flight levels normally used, and proceed as required by the operational situation, or if an ATC clearance has been obtained, proceed in accordance with the clearance.

Note: Altimetry System Errors (ASE) may result in less than 150m (500ft) vertical spacing (less than 300m (1000ft) above FL410) when the above contingency procedure is applied.

278. What is a "PBN contingency procedures" for continental En-route, Terminal and APCH applications ?

(From PBN Manual II-B-3-21)

(PBN MANUAL II-B-3-21 (4th Edition))

Contingency procedures

The pilot must notify ATC of any loss of the RNAV capability, together with the proposed course of action. If unable to comply with the requirements of an RNAV route, pilots must advise ATS as soon as possible. The loss of RNAV capability includes any failure or event causing the aircraft to no longer satisfy the RNAV requirements of the route.

In the event of communications failure, the pilot should continue with the RNAV route in accordance with established lost communications procedures.

(PBN MANUAL II-C-5-13 (4th Edition)): For Approach

Contingency procedures

The pilot must notify ATC of any loss of the RNP APCH capability, together with the proposed course of action. If unable to comply with the requirements of an RNP APCH procedure, pilots must advise ATS as soon as possible. The loss of RNP APCH capability includes any failure or event causing the aircraft to no longer satisfy the RNP APCH requirements of the procedure. The operator should develop contingency procedures in order to react safely following the loss of the RNP APCH capability during the approach.

In the event of communications failure, the pilot must continue with the RNP APCH in accordance with the published lost communications procedure.

279. What are the procedures for RF (Radius to Fix) leg ?

(PBN Manual II-C-App 1-7 (4th Edition))

Operating procedures

The pilot must use either a flight director or autopilot when flying an RF leg. The pilot should comply with any instructions or procedures identified by the manufacturer as necessary to comply with the performance requirements in this appendix.

Procedures with RF legs will be identified on the appropriate chart.

When the dispatch of a flight is predicated on flying an RNP procedure with an RF leg, the dispatcher/pilot must determine that the installed autopilot/flight director is operational.

The pilot is not authorized to fly a published RNP procedure unless it is retrievable by the procedure name from the aircraft navigation database and conforms to the charted procedure.
The lateral path must not be modified, with the exception of complying with ATC clearances/instructions.

The aircraft must be established on the procedure prior to beginning the RF leg.

The pilot is expected to maintain the center line of the desired path on RF legs. For normal operations, cross-track error/deviation (the difference between the displayed path and the

displayed aircraft position relative to the displayed path (i.e. FTE) should be limited to half the navigation accuracy associated with the procedure (e.g. 0.5 NM for RNP 1).

Where published, the pilot must not exceed maximum airspeeds associated with the flyability (design) of the RF leg.

If an aircraft system failure results in the loss of capability to follow an RF turn, the pilot should maintain the current bank and roll out on the charted RF exit course. The pilot should advise ATC as soon as possible of the system failure.

280. What is RAIM ?

(PBN Manual I-(xviii) (4th Edition))

Receiver autonomous integrity monitoring (**RAIM**).

A form of ABAS whereby a GNSS receiver processor determines the integrity of the GNSS navigation signals using only GPS signals or GPS signals augmented with altitude (baro-aiding). This determination is achieved by a consistency check among redundant pseudo-range measurements. At least one additional satellite needs to be available with the correct geometry over and above that needed for the position estimation for the receiver to perform the RAIM function.

281. Do all PBN applications require current Navigation database?

(PBN Manual II-B-2-13 (4th Edition))

Navigation database

Where a navigation database is carried and used, it must be current and appropriate for the region of intended operation and must include the NAVAIDs and way points required for the route.

Note : *— Navigation databases are expected to be current for the duration of the flight. If the AIRAC cycle is due to change during flight, operators and pilots should establish procedures to ensure the accuracy of the navigation data, including the suitability of navigation facilities used to define the routes for the flight. Traditionally, this has been accomplished by verifying electronic data against paper products.*

282. What time does the Navigation database expire ?

(RM 1.1.9.4)

Exceptions to AIRAC Effective Date and Time

Extract from ICAO Annex 15:

Each AIRAC AIP Amendment page, including the cover sheet, shall display an effective date.

When an effective time other than 0000 UTC is used, the effective time shall also be displayed on the cover sheet.

The table below indicates exceptions to the above rule.

Country	Effective Date and Time Other than 0000 UTC on AIRAC Date
Australia (Y)	the day before AIRAC date at 1600 UTC
Canada (C)	0901 UTC
China (Z) (without VH and VM)	the day before AIRAC date at 1600 UTC

Japan (RJ)	the day before AIRAC date at 1500 UTC
Korea, Republic of (RK)	the day before AIRAC date at 1600 UTC
New Zealand (NZ)	the day before AIRAC date at 1200‡ UTC
Pacific AIP (without Cook Islands (NC), Samoa (NS),Tonga (NF), Niue (NI), Fiji Islands (NF))	the day before AIRAC date at 1200 UTC
Samoa (NS)	the day before AIRAC date at 1100 UTC
Tonga (NF)	the day before AIRAC date at 1100 UTC
United States (K) (incl. Alaska (PA), American Samoa (NS), Guam (PG), Hawaii (PH), Palau Island (PT), Puerto Rico (TJ), Virgin Islands (TI))	0901 UTC

283. What is "SLOP" ?

(RM 1.5.2.12.3)

Strategic Lateral Offset Procedures (SLOP)

SLOP are approved procedures that allow aircraft to fly on a parallel track to the right of the centerline relative to the direction of flight to mitigate the lateral overlap probability due to increased navigation accuracy and wake turbulence encounters. Unless specified in the separation standard, an aircraft's use of these procedures does not affect the application of prescribed separation standards.

ICAO Annex 2 requires authorization for the application of SLOP from the appropriate ATS authority responsible for the airspace concerned.

The routes or airspace where application of strategic lateral offsets is authorized, and the procedures to be followed by pilots, shall be promulgated in the AIPs. In some instances, it may be necessary to impose restrictions on the use of strategic lateral offsets, e.g. where their application may be inappropriate for reasons related to obstacle clearance. Route conformance monitoring systems shall account for the application of SLOP.
Where such authorizations and procedures have been published by the respective State, they are mentioned in the respective RSIs and/or CRARs of the Lido Route Manual.
Strategic lateral offsets shall be authorized only in en-route airspace as follows:

- where the lateral separation minima or spacing between route centerlines is 15NM (28km) or more, offsets to the right of the centerline relative to the direction of flight in tenths of a nautical mile up to a maximum of 2NM (3.7km); and
- where the lateral separation minima or spacing between route centre lines is 10NM (19km) or more and less than 15NM (28km), while one aircraft climbs/descends through the level of another aircraft, offsets to the right of the centre line relative to the direction of flight in tenths of a nautical mile up to a maximum of 2NM (3.7km); and
- where the lateral separation minima or spacing between route centerlines is 6NM (11.1km) or more and less than 15NM (28km), offsets to the right of the centerline relative to the direction of flight in tenths of a nautical mile up to a maximum of 0.5NM (0.9km)

The decision to apply a strategic lateral offset shall be the responsibility of the flight crew. The flight crew shall only apply strategic lateral offsets in airspace where such offsets have been authorized

by the appropriate ATS authority and when the aircraft is equipped with automatic offset tracking capability.

Note 1: *Pilots may contact other aircraft on the inter-pilot air-to-air frequency 123.450 to coordinate offsets.*

Note 2: *The SLOP has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, an offset to the right and within the limits specified above may be used*

Note 3: *Pilots are not required to inform ATC that a strategic lateral offset is being applied.*

284. If both GPS receivers fail, what PBN applications will be defected ?

(PBN Manual II-B-1-12 (4th Edition))

Route evaluation for RNP 10 time limits for aircraft equipped only with INS or IRU

An RNP 10 time limit must be established for aircraft equipped only with INS or IRU. When planning operations in areas where RNP 10 is applied, the operator must establish that the aircraft will comply with the time limitation on the routes that it intends to fly.

In making this evaluation, the operator must consider the effect of headwinds and, for aircraft not capable of coupling the navigation system or flight director to the autopilot, the operator may choose to make this evaluation on a one-time basis or on a per-flight basis. The operator should consider the points listed in the following subsections in making this evaluation.

Route evaluation

The operator must establish the capability of the aircraft to satisfy the RNP 10 time limit established for dispatch or departure into RNP 10 airspace.

Start point for calculation

The calculation must start at the point where the system is placed in navigation mode or the last point at which the system is expected to be updated.

Stop point for calculation

The stop point may be one of the following:
the point at which the aircraft will begin to navigate by reference to ICAO standard NAVAIDs (VOR, DME, NDB) and/or comes under ATS surveillance; or the first point at which the navigation system is expected to be updated.

Sources of wind component data

The headwind component to be considered for the route may be obtained from any source acceptable to the aviation authority. Acceptable sources for wind data include: the State's Bureau of Meteorology, National Weather Service, Bracknell, industry sources such as Boeing Winds on World Air Routes, and historical data supplied by the operator.

One-time calculation based on 75 per cent probability wind components

Certain sources of wind data establish the probability of experiencing a given wind component on routes between city pairs on an annual basis. If an operator chooses to make a one-time calculation of RNP 10 time limit compliance, the operator may use the annual 75 per cent probability level to calculate the effect of headwinds (this level has been found to be a reasonable estimation of wind components).

Calculation of time limit for each specific flight
The operator may choose to evaluate each individual flight using flight plan winds to determine whether the aircraft will comply with the specified time limit. If it is determined that the time limit will be exceeded, then the aircraft must fly an alternate route or delay the flight until the time limit can be met. This evaluation is a flight planning or dispatch task.

Effect of en-route updates

Operators may extend their RNP 10 navigation capability time by updating. Approvals for various updating procedures are based upon the baseline for which they have been approved minus the time factors shown below:

automatic updating using DME/DME = baseline minus 0.3 hours (e.g. an aircraft that has been approved for 6.2 hours can gain 5.9 hours following an automatic DME/DME update);

automatic updating using DME/DME/VHF omnidirectional radio range (VOR) = baseline minus 0.5 hours; and manual updating using a method similar to that contained in FAA Order 8400.12A (as amended), Appendix 7 or approved by the aviation authority = baseline minus 1 hour.

285. How can we choose between CPDLC and voice communication ?

(GOLD 2; 5-2, 5-3)

When to use voice and when to use CPDLC
When operating within airspace beyond the range of DCPC VHF voice communication, CPDLC is available and local ATC procedures do not state otherwise, the flight crew should normally choose CPDLC as the means of communication. The flight crew would use voice as an alternative means of communication (e.g. VHF, HF or SATVOICE direct or via a radio operator). However, in any case, the flight crew will determine the appropriate communication medium to use at any given time.

In airspace where both DCPC VHF voice and CPDLC communication services are provided, and local ATC procedures do not state otherwise, the flight crew will determine the communication medium to use at any given time.

Note: ICAO Doc 4444, paragraph 8.3.2, requires that DCPC be established prior to the provision of ATS surveillance services, unless special circumstances, such as emergencies, dictate otherwise. This does not prevent the use of CPDLC for ATC communications, voice being immediately available for intervention and to address non-routine and time critical situations.

To minimize pilot head down time and potential distractions during critical phases of flight, the flight crew should use voice for ATC communications when operating below 10,000 ft AGL.

While the CPDLC message set, as defined in Appendix A, generally provides message elements for common ATC communications, the flight crew may determine voice to be a more appropriate means depending on the circumstances (e.g. some types of non-routine communications).
Note: Refer to paragraph 5.8 for guidelines on use of voice and data communications in emergency and non-routine situations.

During an emergency, the flight crew would normally revert to voice communications. However, the flight crew may use CPDLC for emergency communications if it is either more expedient or if voice contact cannot be established. Refer to paragraph 5.8.2 for guidelines on use.
Note: For ATN B1 aircraft, emergency message elements are not supported. See Appendix A, paragraph A.4, for a list of emergency message elements.

Except as provided in paragraph 5.8.1.2, the flight crew should respond to a CPDLC message via CPDLC, and should respond to a voice message via voice.

Note: This will lessen the opportunity for messages to get lost, discarded or unanswered between the ATSU and the flight crew and cause unintended consequences.

If the intent of an uplink message is uncertain, the flight crew should respond to the uplink message with DM 1 UNABLE and obtain clarification using voice.
Note: For FANS 1/A aircraft, some uplink messages do not have a DM 1 UNABLE response. On these aircraft, the flight crew should respond with DM 3 ROGER and then obtain clarification via voice.

Regardless of whether CPDLC is being used, the flight crew should continuously monitor VHF/HF/UHF guard frequency. In addition, the flight crew should continuously maintain a listening or SELCAL watch on the specified backup or secondary frequency (frequencies). On aircraft capable of two SATCOM channels, one channel may be selected to the phone number for the radio facility assigned to the current ATSU to enable timely voice communications. The second channel may be selected to the company phone number to enable timely voice communications with company dispatch.

286. When should we log on CPDLC before entry into data link airspace ?

(GOLD 2; 5-7)

When to log on initially for data link services
When operating outside data link airspace, the flight crew should initiate a logon 10 to 25 minutes prior to entry into airspace where data link services are provided.

Note: When departing an aerodrome close to or within such airspace, this may require the logon to be initiated prior to departure.

Where a data link service is only provided in upper airspace and where local procedures do not dictate otherwise, the flight crew should log on to that ATSU in whose airspace a data link service will first be used.

When failure of a data link connection is detected, the flight crew should terminate the connection and then initiate a new logon with the current ATSU.

287. What should we do if the CPDLC connection does not automatically transferred after crossing the FIR boundary ?

(GOLD 2; 5-26)

Data link system failures

If an automatic transfer of the CPDLC connection does not occur at the boundary, the flight crew should contact the transferring ATSU by sending DM 67j CPDLC TRANSFER FAILURE (or voice equivalent), advising them that the transfer has not occurred.

In the event of an aircraft data link system failure, the flight crew should notify the ATSU of the situation using the following voice phraseology:

Flight crew	CPDLC FAILURE. CONTINUING ON VOICE
Controller	ROGER. CONTINUE ON VOICE

***Note**.— The flight crew continues to use voice until the functionality of the aircraft system can be re-established.*

288. How should we respond to a CPDLC uplink message ?

(GOLD2; 5-2, 5-10)

Operational differences between voice communications and CPDLC

Uplink messages require special attention to prevent the flight crew from responding to a clearance with DM 0 WILCO, but not complying with that clearance. To minimize errors, when responding to a clearance with DM 0 WILCO, each flight crew member should read the uplink message individually (silently) before initiating a discussion about whether and how to act on the message. Reading a message individually is a key element to ensuring that each flight crew member does not infer any preconceived intent different from what is intended or appropriate. Use of this method can provide a flight crew with an acceptable level of situational awareness for the intended operations.

Flight crew response times for CPDLC uplink messages

System performance requirements have been established to support reduced separation standards. Specific latency times have been allocated to the technical performance, and flight crew and controller response times. Regional/State monitoring agencies analyze actual performance to ensure the technical and operational components of the system meet required standards. For example, to support RCP 240 operations, the flight crew is expected to be able to respond to a CPDLC uplink message within one minute.

289. How much time can we take before responding to a CPDLC uplink message ?

(GOLD2 5-10)

Flight crew response times for CPDLC uplink messages

System performance requirements have been established to support reduced separation standards. Specific latency times have been allocated to the technical performance, and flight crew and controller response times. Regional/State monitoring agencies analyze actual performance to ensure the technical and operational components of the system meet required standards. For example, to support RCP 240 operations, the flight crew is expected to be able to respond to a CPDLC uplink message within one minute.

For an ATN-B1 aircraft, the flight crew should respond to a CPDLC uplink message within 100 seconds to prevent the CPDLC uplink message from automatically timing out.

Note.- ATN-B1 aircraft use a CPDLC message response timer, which is set at 100 seconds upon receipt of the CPDLC uplink message. If the flight crew has not sent a response within this time:

the flight crew is no longer provided with any response prompts for the message;
the aircraft sends an ERROR message for display to the controller; and
the aircraft and ground systems close the dialogue.

When a CPDLC uplink message automatically times out, the flight crew should contact ATC by voice.

The flight crew should respond to CPDLC messages as soon as practical after they are received. For most messages, the flight crew will have adequate time to read and respond within one minute. However, the flight crew should not be pressured to respond without taking adequate time to fully understand the CPDLC message and to satisfy other higher priority operational demands. If additional time is needed, the flight crew should send a DM 2 STANDBY response.
Note.— For ATN B1 aircraft systems, if the flight crew does not send an operational response within 100 seconds after the DM 2 STANDBY was sent, the CPDLC uplink message will time out (refer to paragraph 5.3.2.3).

If a DM 2 STANDBY response has been sent, the flight crew should provide a subsequent closure response to the CPDLC message.

Note 1.— In the case of a DM 2 STANDBY response, the uplink message remains open until the flight crew responds with a DM 0 WILCO or DM 1 UNABLE. If the closure response is not received within a reasonable period of time, the controller is expected to query the flight crew per paragraph 4.3.1.2.

Note 2.— Transmission times for messages may vary for a number of reasons including the type of transmission media, network loading, or the criteria for transitioning from one media to another (e.g. VHF/Satcom). Operational response times may vary depending on workload and complexity of the instruction or clearance.

290. If during the weather deviation, we are cleared to proceed direct to a way point. Do we need to report "BACK ON ROUTE" via CPDLC ?
(GOLD2 5-23)

Reporting back on route
When the flight crew no longer needs the deviation clearance and is back on the cleared route, the flight crew should send a DM 41 BACK ON ROUTE report.

a) If during the weather deviation, the flight crew receives a clearance to proceed direct to a waypoint – and the flight crew responds to the clearance with DM 0 WILCO – the aircraft is considered to be on the cleared route. Therefore, the flight crew should send a DM 41 BACK ON ROUTE report after they execute the "direct to" clearance; and
b) If the aircraft is off route during a weather deviation clearance and proceeding direct to a waypoint on the cleared route, the flight crew should send a DM 41 BACK ON ROUTE report after the aircraft has sequenced the way point on the cleared route.

Note.— If a DM 41 BACK ON ROUTE report is received while the aircraft is still off route, the incorrect information provided to ATC may affect the separation standards in use. Alternatively, the flight crew may consider requesting a clearance direct to the way

point – on receipt of the uplink clearance, the procedure specified in item a) above applies.

291. After being cleared to proceed direct to a waypoint, how can we request a weather deviation via CPDLC ?

(GOLD2 5-19, 5-23)

Weather deviations and offsets

General

The flight crew may use CPDLC to request a weather deviation clearance or an offset clearance. The difference between a weather deviation and an offset is portrayed in Figure 5-3.

a) A weather deviation clearance authorizes the flight crew to deviate up to the specified distance at their discretion in the specified direction from the route in the flight plan; and

b) An offset clearance authorizes the flight crew to operate at the specified distance in the specified direction from the route in the flight plan. A clearance is required to deviate from this offset route.

Note : *— CPDLC offers more timely coordination of weather deviation clearances. However, the flight crew may deviate due to weather under the provisions of ICAO Doc 4444, paragraph 15.2.3. The extent to which weather deviations are conducted may be a consideration when applying reduced separations, as noted in ICAO Doc 4444, paragraph 5.4.2.6.4.3.*

Flight crews should use the correct message element when requesting an off-route clearance.

Note.— The difference between a weather deviation and an offset affects how ATC separate aircraft.

Figure 5-3. Offset and weather deviation

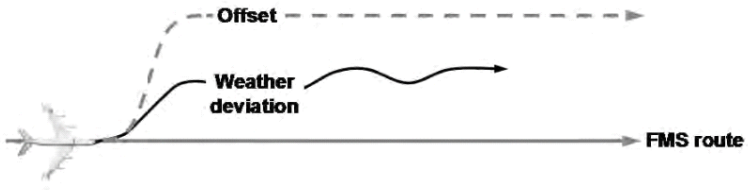


Figure 5-3. Offset and weather deviation

Weather deviation requests and offsets

When requesting a weather deviation or offset clearance, the flight crew should specify the distance off route with respect to the cleared route of the aircraft. If the flight crew has received an off-route clearance and then requests and receives a subsequent off-route clearance, the new clearance supersedes the previous clearance (i.e. only the most recent clearance is valid).

Reporting back on route

When the flight crew no longer needs the deviation clearance and is back on the cleared route, the flight crew should send a DM 41 BACK ON ROUTE report.

a) If during the weather deviation, the flight crew receives a clearance to proceed direct to a waypoint – and the flight crew responds to the clearance with DM 0 WILCO – the aircraft is considered to be on the cleared route. Therefore, the flight crew should send a DM 41 BACK ON ROUTE report after they execute the “direct to” clearance; and

b) If the aircraft is off route during a weather deviation clearance and proceeding direct to a waypoint on the cleared route, the flight crew should send a DM 41 BACK ON ROUTE report after the aircraft has sequenced the waypoint on the cleared route.

Note.— If a DM 41 BACK ON ROUTE report is received while the aircraft is still off route, the incorrect information provided to ATC may affect the separation standards in use. Alternatively, the flight crew may consider requesting a clearance direct to the waypoint – on receipt of the uplink clearance, the procedure specified in item a) above applies.

292. How do we use CPDLC's "FREE TEXT" ?

(GOLD 2; 5-15)

Free text

The flight crew should avoid the use of the free text message element. However, its use may offer a viable solution to enhance operational capability.

Note 1.— The use of standard message elements is intended to reduce the possibility of misinterpretation and ambiguity.

Note 2.— A free text message (such as DM 67k REVISED ETA [position] [time]) does not require a response from the ATSU.

Free text messages should be used only when an appropriate standard message element does not exist.

When composing a free text message, the flight crew should use standard ATS phraseology and format and avoid nonessential words and phrases. Abbreviations should only be included in free text messages when they form part of standard ICAO phraseology, for example, ETA.

293. What is "FLIGHT ID" ?

(DOC 9869; PBCS 2th Edition)

(DOC 9869; PBCS 2th Edition)

Flight identification - A group of numbers, which is usually associated with an ICAO designator for an aircraft operating agency, to identify the aircraft in Item 7 of the flight plan.

294. What happens when we turn ADS EMERGENCY ON ?

(GOLD 2; 2-47/48)

ADS EMERGENCY — sends an alert to ATC indicating an emergency situation (resets to ADS EMERGENCY OFF at power up)

Periodic contract

The range and resolution of the time interval parameter in the periodic contract allows for an interval to be specified between 1 second and 4,096 seconds (approximately 68 minutes). However, RTCA DO-258A/EUROCAE ED-100A limits the minimum interval to 64 seconds. If the ground system specifies a time interval less than 64 seconds, the aircraft system will respond with a non-compliance notification and establish a periodic contract with a 64-second reporting interval. If the ground system does not specify a time interval, the aircraft will establish a periodic contract of 64 seconds for emergency periodic reporting and 304 seconds for normal periodic reporting.

295. What is Performance-based Communication and Surveillance (PBCS) concept ? (Lido General 1.6.7)

Performance-based Communication and Surveillance (PBCS) Concept

The Performance-based Communication and Surveillance (PBCS) concept provides objective operational criteria to evaluate different and emerging communication and surveillance technologies, intended for evolving Air Traffic Management (ATM) operations. Once these criteria have been established and accepted, implementation of a specific ATM operation including its technical and human performance may be evaluated against these operational criteria to assess their viability. The PBCS concept and guidelines are applicable to any Air Traffic Services (ATS) system change that is predicated on communication and/or surveillance performance.

The PBCS concept is aligned with that of Performance-based Navigation (PBN). While the PBN concept applies Required Navigation Performance (RNP) and area navigation (RNAV) specifications to the navigation element, the PBCS concept applies Required Communication Performance (RCP) and Required Surveillance Performance (RSP) specifications to communication and surveillance elements, respectively. Each RCP/RSP specification includes allocated criteria among the components of the communication and surveillance systems involved.

Where beneficial, RCP, RNP/RNAV and RSP specifications are applied to communication, navigation and surveillance elements to ensure that the operational system and its components perform in accordance with the specifications. The illustration below provides an overview of the performance-based communications, navigation, and surveillance (CNS)/ATM model, which characterizes the relationship of the performance-based specifications among CNS elements supporting an ATM operation.

There are some differences between the PBCS concept and PBN concept:

a) The PBCS concept applies RCP and RSP specifications, which allocate criteria to ATS provision, including communication services, aircraft capability, and the aircraft operator; whereas the PBN concept applies RNP/RNAV specifications, which allocate criteria only to the aircraft capability and the aircraft operator; and

b) The PBCS concept includes post-implementation monitoring programmes, on a local and regional basis, with global exchange of information; whereas the PBN concept includes real time monitoring and alerting functionality in the aircraft capability.

Note: PBCS includes real time alerts (e.g. when a communication transaction expires or a position report is overdue) that are conceptually different than the PBN alerts (e.g. RNP UNABLE).