(3) Rotate the burner from the test position to the warm-up position. Prior to lighting the burner, ensure that the calorimeter face is clean of soot deposits, and there is water running through the calorimeter. Examine and clean the burner cone of any evidence of build-up of products of combustion, soot, etc. Soot build-up inside the burner cone may affect the flame characteristics and cause calibration difficulties. Since the burner cone may distort with time, dimensions should be checked periodically.

(4) While the burner is still rotated to the warm-up position, turn on the blower/motor, igniters and fuel flow, and light the burner. Allow it to warm up for a period of 2 minutes. Move the burner into the calibration position and allow 1 minute for calorimeter stabilization, then record the heat flux once every second for a period of 30 seconds. Turn off burner, rotate out of position, and allow to cool. Calculate the average heat flux over this 30-second duration. The average heat flux should be 18.2 ± 0.9 W/cm^2 (16.0 ± 0.8 Btu/ft^2 sec).

(5) Position the burner in front of the thermocouple rake. After checking for proper alignment, rotate the burner to the warm-up position, turn on the blower/motor, igniters and fuel flow, and light the burner. Allow it to warm up for a period of 2 minutes. Move the burner into the calibration position and allow 1 minute for thermocouple stabilization, then record the temperature of each of the 7 thermocouples once every second for a period of 30 seconds. Turn off burner, rotate out of position, and allow to cool. Calculate the average temperature of each thermocouple over this 30-second period and record. The average temperature of each of the 7 thermocouples should be 1038 ± 56°C (1900 ± 100°F).

(6) If either the heat flux or the temperatures are not within the specified range, adjust the burner intake air velocity and repeat the procedures of paragraphs (4) and (5) above to obtain the proper values. Ensure that the inlet air velocity is within the range of 10.92 ± 0.25 m/s (2150 ft/min ± 50 ft/min).

(7) Calibrate prior to each test until consistency has been demonstrated. After consistency has been confirmed, several tests may be conducted with calibration conducted before and after a series of tests.

(f) Test procedure.

(1) Secure the two insulation blanket test specimens to the test frame. The insulation blankets should be attached to the test rig centre vertical former using four spring clamps positioned as shown in figure 7 (according to the criteria of paragraph (c)(3)(iv) of Part VII of this Appendix).

(2) Ensure that the vertical plane of the burner cone is at a distance of 102 ± 3 mm (4 ± 0.125 inch) from the outer surface of the horizontal stringers of the test specimen frame, and that the burner and test frame are both situated at a 30° angle with respect to vertical.

(3) When ready to begin the test, direct the burner away from the test position to the warm-up position so that the flame will not impinge on the specimens prematurely. Turn on and light the burner and allow it to stabilize for 2 minutes.

(4) To begin the test, rotate the burner into the test position and simultaneously start the timing device.

(5) Expose the test specimens to the burner flame for 4 minutes and then turn off the burner. Immediately rotate the burner out of the test position.

(6) Determine (where applicable) the burnthrough time, or the point at which the heat flux exceeds 2.27 W/cm^2 (2.0 Btu/ft^2 sec).

(g) Report.

(1) Identify and describe the specimen being tested.

(2) Report the number of insulation blanket specimens tested.

(3) Report the burnthrough time (if any), and the maximum heat flux on the back face of the insulation blanket test specimen, and the time at which the maximum occurred.

(h) Requirements.

(1) Each of the two insulation blanket test specimens must not allow fire or flame penetration in less than 4 minutes.

(2) Each of the two insulation blanket test specimens must not allow more than 2.27 W/cm^2 (2.0 Btu/ft^2 sec) on the cold side of the insulation specimens at a point 30.5 cm (12 inches) from the face of the test rig.

[Amdt 25/6]

APPENDIX H – INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

ED Decision 2016/010/R

(See AMC to Appendix H)

H25.1 General

ED Decision 2017/015/R

(a) This Appendix specifies requirements for the preparation of Instructions for Continued Airworthiness as required by CS 25.1529 and CS 25.1729

(b) The Instructions for Continued Airworthiness for each aeroplane must include the Instructions for Continued Airworthiness for each engine and propeller (hereinafter designated 'products'), for each appliance required by this CS-25 and any required information relating to the interface of those appliances and products with the aeroplane. If Instructions for Continued Airworthiness are not supplied by the manufacturer of an appliance or product installed in the aeroplane, the Instructions for Continued Airworthiness for the aeroplane must include the information essential to the continued airworthiness of the aeroplane.

(c) The applicant must consider the effect of ageing structures in the Instructions for Continued Airworthiness (see AMC 20-20).

[Amdt 25/5]
[Amdt 25/19]

H25.2 Format

ED Decision 2003/2/RM

(a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.

(b) The format of the manual or manuals must provide for a practical arrangement.

H25.3 Content

ED Decision 2003/2/RM

The contents of the manual or manuals must be prepared in a language acceptable to the Agency. The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:

(a) Aeroplane maintenance manual or section

(1) Introduction information that includes an explanation of the aeroplane's features and data to the extent necessary for maintenance or preventive maintenance.

(2) A description of the aeroplane and its systems and installations including its engines, propellers, and appliances.

(3) Basic control and operation information describing how the aeroplane components and systems are controlled and how they operate, including any special procedures and limitations that apply.

(4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location

of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.

(b) Maintenance Instructions

(1) Scheduling information for each part of the aeroplane and its engines, auxiliary power units, propellers, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, reference may be made to information from an accessory, instrument or equipment manufacturer as the source of this information if it is shown that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross references to the Airworthiness Limitations section of the manual must also be included. In addition, an inspection programme that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the aeroplane must be included.

(2) Troubleshooting information describing probable malfunctions, how to recognise those malfunctions, and the remedial action for those malfunctions.

(3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.

(4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the centre of gravity, lifting and shoring, and storage limitations.

(c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.

(d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.

(e) Information needed to apply protective treatments to the structure after inspection.

(f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.

(g) A list of special tools needed.

H25.4 Airworthiness Limitations Section

ED Decision 2020/024/R

(a) The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth -

(1) Each mandatory modification time, replacement time, structural inspection interval, and related structural inspection procedure approved under CS 25.571;

(2) Each mandatory replacement time, inspection interval, related inspection procedure, and all the critical design configuration control limitations approved under CS 25.981 for the fuel tank system.

(3) Any mandatory replacement time of EWIS components as defined in CS 25.1701 (see AMC Appendix H 25.4(a)(3)).

(4) A limit of validity (LOV) of the engineering data that supports the structural maintenance programme, stated as a total number of accumulated flight cycles or flight hours or both, approved under CS 25.571. Until the full-scale fatigue testing is completed and the LOV is approved, the Airworthiness Limitations Section must specify an interim limitation restricting aircraft operation to not more than half the number of the cycles accumulated on the fatigue test article.

(5) Each Certification Maintenance Requirement established to comply with any of the applicable requirements of CS-25 (see AMC 25-19).

(6) Each mandatory replacement time, inspection interval, and related inspection and test procedure, and each critical design configuration control limitation for each lightning protection feature approved under CS 25.954.

(b) If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: 'The Airworthiness Limitations Section is approved and variations must also be approved'.

[Amdt 25/5]
[Amdt 25/19]
[Amdt 25/20]
[Amdt 25/26]

AMC to Appendix H, H25.4(a)(3) Mandatory replacement time of EWIS components as defined in CS 25.1701

ED Decision 2008/006/R

In accordance with subparagraph H25.4(a)(3) applicants are required to include in the Airworthiness Limitations section of the Instructions for Continued Airworthiness any mandatory replacement times for EWIS components. EWIS components are those defined by CS 25.1701. Generally, EWIS components are designed and selected to last for the service life of the aeroplane. Any EWIS component that must be replaced at regular intervals to maintain the airworthiness of the associated system or aeroplane must be specified, with its required replacement interval, in the Airworthiness Limitations section of the ICA.

[Amdt 25/5]

H25.5 Electrical Wiring Interconnection System Instructions for Continued Airworthiness

ED Decision 2009/017/R

The applicant must prepare Instructions for Continued Airworthiness applicable to Electrical Wiring Interconnection System as defined in CS 25.1701. (see AMC Appendix H 25.5)

[Amdt 25/5]
[Amdt 25/8]

AMC to Appendix H, H25.5 Instructions for Continued Airworthiness applicable to EWIS

ED Decision 2008/006/R

In accordance with subparagraph H25.5 the applicant must prepare Instructions for Continued Airworthiness (ICA) applicable to EWIS as defined by 25.1701 that should include the following:

1 Maintenance and inspection requirements for the EWIS developed with the use of an enhanced zonal analysis procedure (EZAP) that includes:

a. Identification of each zone of the aeroplane.

b. Identification of each zone that contains EWIS.

c. Identification of each zone containing EWIS that also contains combustible materials.

d. Identification of each zone in which EWIS is in close proximity to both primary and back-up hydraulic, mechanical, or electrical flight controls and lines.

e. Identification of –

— Tasks, and the intervals for performing those tasks, that will reduce the likelihood of ignition sources and accumulation of combustible material, and

— Procedures, and the intervals for performing those procedures, that will effectively clean the EWIS components of combustible material if there is not an effective task to reduce the likelihood of combustible material accumulation.

f. Instructions for protections and caution information that will minimize contamination and accidental damage to EWIS, as applicable, during the performance of maintenance, alteration, or repairs.

2 Acceptable EWIS maintenance practices in a standard format:

Applicants should document EWIS maintenance practices in a standard format. This is typically accomplished with publication of a standard wiring practices manual (SWPM). The rule is not intended to require that every manufacturer's SWPM is identical. The intent is to enable people performing EWIS maintenance and repairs to find information in the SWPM more quickly and easily, regardless of what aeroplane model they are currently working on. Standard wiring practices include procedures and practices for the installation, repair, and removal of EWIS components, including information about wire splices, methods of bundle attachment, connectors and electrical terminal connections, bonding, and grounding. A SWPM is not a design manual, and designers of EWIS modifications for specific aeroplane models should not use it as such. But it does provide the designer with insight into the types of EWIS components used by the TC holder and the procedures recommended by the manufacturer for maintenance or repair that supports continued airworthiness of the components. AMC 20-23 "Development of Standard Wiring Practices Documentation," provides guidance on how to comply.

3 Wire separation requirements as determined under 25.1707:

Applicants should include EWIS separation requirements in the ICA. EWIS separation guidelines are important for maintaining the safe operation of the aeroplane. Maintenance personnel need to be aware of the type certificate holder's separation requirements so they do not compromise separation in previously certified systems.

Determination of EWIS separation requirements is required by 25.1707. To comply with H25.5, the applicant should develop a way to convey these separation requirements and place them in the ICA. For example, if an aeroplane has a fly-by-wire flight control system and a minimum

of 2 inches of physical separation is needed between the EWIS associated with the flight control system and other EWIS, this information should be available in the ICA.

Similarly, the separation of certain wires in fuel tank systems may be critical design configuration control items and therefore qualify as an airworthiness limitation. Maintenance personnel need these guidelines and limitations because many times wire bundles must be moved or removed to perform maintenance.

The separation data included in the ICA can take many forms. If a particular aeroplane model has fly-by-wire flight controls, the manufacturer may designate the EWIS associated with the flight control systems by a certain identification scheme (as required by 25.1711), and in the ICA state that EWIS so designated must be maintained with XX amount of separation from all other EWIS and YY amount of separation from other aeroplane systems and structure. The manufacturer can then repeat this information for other EWIS associated with other aeroplane systems. The ICA could indicate how EWIS associated with IFE and other passenger convenience systems is identified, and that this EWIS must be maintained XX inches from other categories of EWIS or structure.

It is not the intent of the regulation to require a type design holder or an applicant to divulge proprietary information in order to comply. Certain information, however, needs to be made available to modifiers and maintainers to ensure that future modifications and repairs do not invalidate previously certified designs.

4 Information explaining the EWIS identification method and requirements for identifying any changes to EWIS under CS 25.1711. This paragraph requires that the ICA contain information explaining the EWIS identification method and requirements for identifying any changes to EWIS. This requirement is intended to ensure that future modifications that add EWIS, identify the added EWIS with the same type of identification scheme used by the original aeroplane manufacturer. This information will help modification designers and modification personnel avoid improper modification and repair of existing EWIS or improper installation of new EWIS. These personnel need to review the applicable standard wiring practices, EWIS identification requirements, and electrical load data for the aeroplane they are modifying.

5 Electrical load data and instructions for updating that data. The ICA should contain electrical load data and instructions for updating that data. Electrical load data and the instructions for updating that data are necessary to help ensure that future modifications or additions of equipment that consume electrical power do not exceed the generating capacity of the onboard electrical generation and distribution system. Maintaining a record of actual airplane electrical loads is important to ensure that modifications to the original design do not impose electrical loads on the electrical generating system in excess of the system's capability to provide the necessary power and maintain necessary margins. To comply with the requirements of this paragraph applicants need to provide:

a. Electrical generating capacity of each source of normal electrical power generation.

b. Electrical generating capacity of each source of emergency power generation.

c. Electrical load capacity of each of electrical bus.

d. Actual electrical loading of each electrical bus.

6 The ICA must be in the form of a document appropriate for the information to be provided, and they must be easily recognizable as EWIS ICA.

[Amdt 25/5]

H25.6 Information system security Instructions for Continued Airworthiness

ED Decision 2020/006/R

The applicant must prepare Instructions for Continued Airworthiness (ICA) that are applicable to aircraft information system security protection as required by CS 25.1319 (see AMC 20-42 Section 9).

[Amdt 25/25]

APPENDIX I – AUTOMATIC TAKEOFF THRUST CONTROL SYSTEM (ATTCS)

I 25.1 General

ED Decision 2003/2/RM

(a) This Appendix specifies additional requirements and limitations for aeroplanes equipped with an engine control system that automatically resets thrust or power on the operating engine(s) when any engine fails during take-off, and for which performance credit is limited to that of paragraph 25.3(b) of this Appendix. When performance credit is not so limited, Special Conditions will apply.

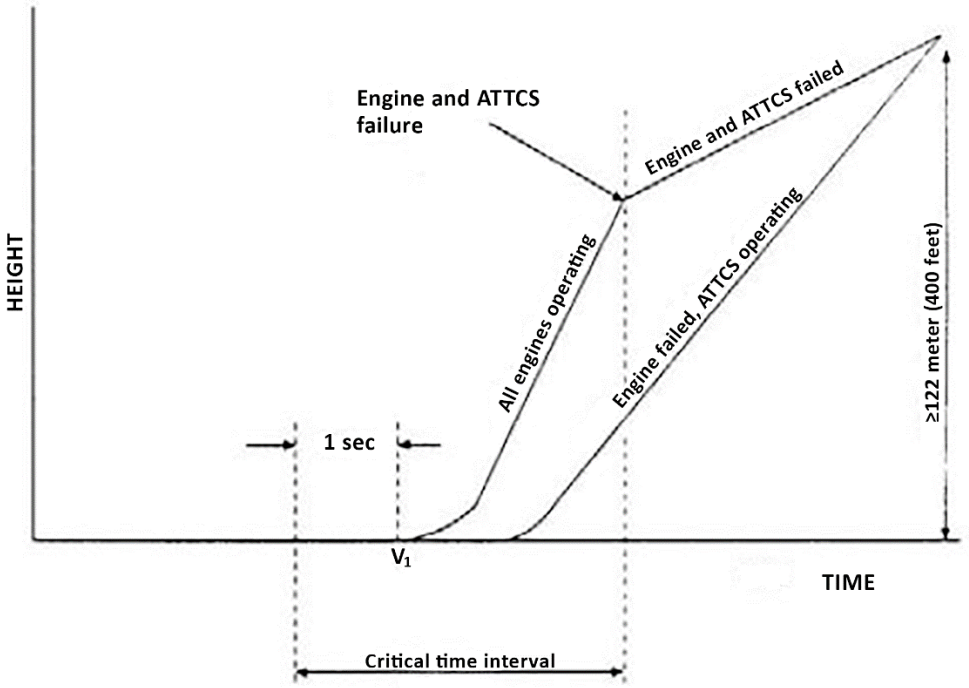
(b) With the ATTCS system and associated systems functioning normally as designed, all applicable requirements of CS-25, except as provided in this Appendix, must be met without requiring any action by the crew to increase thrust or power.

I 25.2 Definitions

ED Decision 2003/2/RM

(a) *AutomaticTakeoff Thrust Control System (ATTCS)*. An ATTCS system is defined as a system which automatically resets thrust or power on the operating engine(s) when any engine fails during take-off. For the purpose of the requirements in this Appendix, the ATTCS system comprises all elements of equipment necessary for the control and performance of each intended function, including all devices both mechanical and electrical that sense engine failure, transmit signals and actuate fuel controls or power levers of the operating engine(s) to achieve scheduled thrust or power increases, the engine control system and devices which furnish cockpit information on system operation.

(b) *Critical Time Interval.* When conducting an ATTCS take-off, the critical time interval is between one second before reaching V_1, and the point on the gross take-off flight path with all engines operating where, assuming a simultaneous engine and ATTCS system failure, the resulting flight path thereafter intersects the gross flight path, determined in accordance with CS 25.115, at not less than 122 m (400 feet) above the take-off surface. This definition is shown in the following figure:



I 25.3 Performance requirements

ED Decision 2003/2/RM

All applicable performance requirements of CS-25 must be met with the ATTCS system functioning normally as designed, except that the propulsive thrust obtained from each operating engine after failure of the critical engine during take-off, and the thrust at which compliance with the one-engine-inoperative climb requirements in CS 25.121(a) and (b) is shown, must be assumed to be not greater than the lesser of –

(a) The actual propulsive thrust resulting from the initial setting of power or thrust controls with the ATTCS system functioning normally as designed, without requiring any action by the crew to increase thrust or power until the aeroplane has achieved a height of 122 m (400 feet) above the take-off surface; or

(b) 111 percent of the propulsive thrust which would have been available at the initial setting of power or thrust controls in the event of failure of the ATTCS system to reset thrust or power, without any action by the crew to increase thrust or power until the aeroplane has achieved a height of 122 m (400 feet) above the take-off surface.

Note 1. The limitation of performance credit for ATTCS system operation to 111 percent of the thrust provided at the initial setting is intended to:

(i) Assure an adequate level of climb performance with all engines operating at the initial setting of power or thrust controls, and

(ii) Limit the degradation of performance in the event of a critical engine failure combined with failure of the ATTCS system to operate as designed.

Note 2. For propeller-driven aeroplanes, propulsive thrust means the total effective propulsive force obtained from an operating engine and its propeller.