



Federal Aviation Administration

Memorandum

Date: February 23, 2015

To: Manager, Transport Standards Staff, International Branch, ANM-116

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Sekhar Vaidyanath, ANM-117

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Function and Installation, and Equipment Systems and Installations on the Airbus Single Aisle New Engine Option Model Airplanes, FAA Project # AT00949IB-T

ELOS Memo#: AT00949IB-T-SA-1

Reg. Ref.: §§ 25.1301 and 25.1309

This memorandum informs the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate (TAD) on the establishment of an equivalent level of safety (ELOS) finding for the Airbus Single Aisle (SA) New Engine Option (NEO) Model airplanes.

Background

Airbus has submitted a request for an ELOS finding to incorporate within the Airbus SA NEO model FAA certification basis the Aviation Rulemaking Advisory Committee (ARAC) recommended changes to Title 14, Code of Federal Regulations (14 CFR) sections 25.1301 and 25.1309 as submitted to the FAA in August 2002.

Applicable regulation(s)

§§ 25.1301 and 25.1309

Regulation(s) requiring an ELOS finding

§§ 25.1301 and 25.1309

Description of compensating design features or alternative standards which allow the granting of the ELOS finding (including design changes, limitations or equipment needed for equivalency)

On April 29, 2003, the FAA published in the Federal Register a notice of availability of the ARAC recommendation regarding proposed changes to §§ 25.1301 and 25.1309, the creation of a new § 25.1310, and the revision of relevant advisory material.

The ARAC recommended revisions results in the following proposed rules :
§ 25.1301 Function and installation.

- a) Each Item of installed equipment must
 - 1. Be of as kind and designed appropriately to its intended function;
 - 2. Be labelled as to its identification, function, or operating limitation, or any applicable combination of those factors; and
 - 3. Be installed according to limitations specified for that equipment.

- b) EWIS must meet the requirements of Subpart H of this part.

§ 25.1309 Equipment, systems and installations.

The requirements of this section, except as identified below, are applicable, in addition to specific design requirements of part 25, to any equipment or system as installed in the airplane. Although this section does not apply to the performance and flight characteristic requirements of Subpart B and the structural requirements of Subpart C and D, it does apply to any system on which compliance with any of those requirements is dependent. Jams of flight control surfaces or pilot controls covered by § 25.671(c)(3) are excepted from the requirements of § 25.1309(b)(1)(ii). Single failures covered by § 25.735(b)(1)(v) and § 25.812 are excepted from the requirements of § 25.1309(b). The requirements of § 25.1309(b) apply to powerplant installations as covered by § 25.901(c).

- a) The airplane equipment and systems must be designed and installed so that:
 - (1) Those required for type certification or by operating rules, or whose improper functioning would reduce safety, perform as intended under the airplane operating and environmental conditions.
 - (2) Other equipment and systems do not adversely affect the safety of the airplane or its occupants, or the proper functioning of those covered by sub-paragraph (a)(1) of this paragraph.

- b) The airplane systems and associated components, considered separately and in relation to other systems, must be designed and installed so that:
 - (1) Each catastrophic failure condition
 - i. Is extremely improbable; and
 - ii. Does not result from a single failure; and
 - (2) Each hazardous failure condition is extremely remote; and

- (3) Each major failure condition is remote.
- c) Information concerning unsafe system operating conditions must be provided to the crew to enable them to take appropriate corrective action. A warning indication must be provided if immediate corrective action is required. Systems and controls, including indications and annunciations must be designed to minimize crew errors which could create additional hazards.
 - d) Not used.
 - e) Not used.
 - f) EWIS must be assessed in accordance with the requirements if § 25.1709.

Explanation of how design features or alternative standards provide an ELOS to that intended by the regulation

The alternative standards defined above are considered to be an improvement of the existing §§ 25.1301 and 25.1309 without significant additional compliance costs for the applicant, and with the benefit of clearer FAA/EASA harmonized regulations. Airbus' demonstration of compliance with the ARAC recommended §§ 25.1301 and 25.1309, on the SA NEO model airplanes provides an equivalent or possible increased level of safety compared to direct compliance with the existing §§ 25.1301 and 25.1309.

Because the ARAC recommendation was developed prior to the adoption of the Electrical Wiring Interconnection Systems (EWIS) requirements, it did not address §§ 25.1301(b) and 25.1309(f) at Amendment 25-123 (December 10, 2007). However, §§ 25.1301(b) and 25.1309(f) at Amendment 25-123, and § 25.1709 at Amendment 25-123 are included in the SA NEO certification basis, therefore these requirements are included in this ELOS finding.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in the SA NEO model airplanes project issue paper SA-1, titled "Equipment, Systems, and Installation Requirements: Use of ARAC Recommendations." This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The TAD has assigned a unique ELOS memorandum number (see front page) to facilitate archiving and retrieval of this ELOS finding. This ELOS memorandum number should be listed in the Type Certificate Data Sheet under the Certification Basis section (TC's and ATC's) in accordance with the statement below:

ELOS findings have been made for the following regulation(s):
§ 25.1301 Function and Installation and
§ 25.1309 Equipment, Systems, and Installations
(documented in TAD ELOS Memo AT00949IB-T-SA-1)

Original Signed by Tom Groves

February 23, 2015

Transport Airplane Directorate,
Aircraft Certification Service

Date

ELOS Originated by: Transport Standards Staff	Project Engineer: Sekhar Vaidyanath	Routing Symbol: ANM-117
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