



# Federal Aviation Administration

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## Memorandum

Date: April 1, 2011

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

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Linh Le, ANM-117

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for use of ARAC Recommended Revision to §§ 25.1301 and 25.1309 on Airbus Model A350 (FAA Project Number TC0544IB-T)

ELOS Memo#: TC0544IB-T-S-2

Reg. Ref.: §§ 25.1301, 25.1309

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This memorandum informs the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate on the establishment of an equivalent level of safety finding for the Airbus Model A350 aircraft.

### **Background**

Airbus has submitted a request for an equivalent safety finding to incorporate within the model A350 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 regulations**

§§ 25.1301, 25.1309

### **Regulations requiring an ELOS finding**

§§ 25.1301, 25.1309

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

On April 29, 2003, the FAA published in the Federal Register a notice of availability of Aviation Rulemaking Advisory Committee (ARAC) recommendations regarding proposed changes to §§ 25.1301, 25.1309, the creation of a new § 25.1310, and the revision of relevant advisory material. The alternate standards used for the A350 ELOS finding consist of the ARAC recommended revisions and post 14 CFR amendment 25-123 changes to these sections as follows:

§ 25.1301 Function and installation.

- (a) Each item of installed equipment must
  - (1) Be of a kind and design appropriate to its intended function;
  - (2) Be labeled as to its identification, function, or operating limitations, or any applicable combination of these 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 Subparts 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 exempted from the requirements of § 25.1309(b)(1)(ii). Single failures covered by § 25.735(b)(1) are exempted from the requirements of § 25.1309(b). The failure effects covered by §§ 25.810(a)(1)(v) and 25.812 are exempted 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 subparagraph (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 annunciators 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 of Sec. 25.1709.

**Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation**

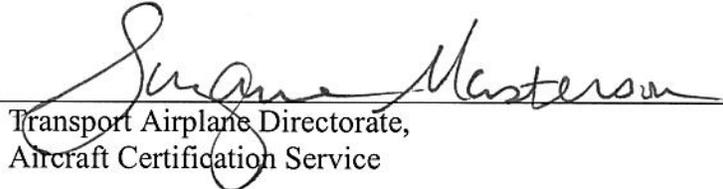
The recommendations are considered to be an improvement of the existing §§ 25.1301 and 25.1309 without significant additional compliance costs for the applicant, and with the benefit of clearer FAA/EASA harmonized regulations. Airbus's demonstration of compliance with the ARAC recommended §§ 25.1301 and 25.1309, on the A350 provides an equivalent or possibly 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), it did not address §§ 25.1301 (b) and 25.1309(f) as shown in amendment 123 (December 10, 2007). However, compliance to §§ 25.1301(b) and 25.1309(f) at amendment 123, and § 25.1709 is included in the A350 certification basis, therefore it needs not be included in this ELOS finding.

**FAA approval and documentation of the ELOS finding**

The FAA has approved the aforementioned equivalent level of safety finding in the A350 project issue paper S-2, 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 Transport Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number should be listed in the Type Certificate Data Sheet under the Certification Basis section (TC's & ATC's) or in the Limitations and Conditions Section of the STC Certificate. An example of an appropriate statement is provided below:

Equivalent Level of Safety Findings have been made for the following regulation(s):  
§§ 25.1301, 25.1309 (documented in TAD ELOS Memo TC0544IB-T-S-2.)

  
Transport Airplane Directorate,  
Aircraft Certification Service

April 1, 2011  
Date

ELOS Originated by Transport Standards Staff:	Project Engineer Linh Le	Routing Symbol ANM-117
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