



Federal Aviation Administration

Memorandum

Date: October 30, 2014

To: Manager, International Branch, ANM-116

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Doug Bryant, ANM-112

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Validation of Maintenance Procedures for Extended Operations (ETOPS) Significant Systems on a Model A350-900 airplane, FAA Project # TC0544IB-T

ELOS Memo #: TC0544IB-T-EE-7

Regulatory Ref: §§ 25.1529, 25.1535 and K25.2.2(c) of appendix K of part 25

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 Model A350-900 airplane.

Background

Title 14, Code of Federal Regulations (14 CFR) 25.1535 requires “each applicant seeking ETOPS type design approval must comply with the provisions of Appendix K of this part.” An applicant for Extended Operations (ETOPS) type design approval of a two-engine airplane must use one of the methods described in section K25.2.1, K25.2.2, or K25.2.3 of appendix K of part 25. Airbus has chosen to demonstrate compliance using the Early ETOPS method defined in section K25.2.2 of appendix K of part 25. Section K25.2.2(c) of appendix K of part 25 requires that an “applicant must validate all maintenance and operational procedures for ETOPS significant systems.” Airbus has requested Early ETOPS type design approval for the Model A350-900 airplane prior to completing their validation of all maintenance procedures for ETOPS significant systems.

The maintenance procedures for ETOPS significant systems are part of the instructions for continued airworthiness (ICA). Section 25.1529 states that “The instructions may be incomplete at type certification if a program exists to ensure their completion prior to delivery of the first airplane or issuance of a standard certificate of airworthiness, whichever occurs later.”

Since section K25.2.2(c) of appendix K of part 25 requires validation of all maintenance and operational procedures for ETOPS significant systems, this requirement must be fulfilled prior to Early ETOPS type design approval. However, some aspects of ICAs are routinely deferred until after type certification using the provision in § 25.1529. The allowance under § 25.1529 conflicts with section K25.2.2(c) of appendix K of part 25 since Early ETOPS is intended to be approved concurrent with type design approval (or very shortly after).

Applicable regulation(s)

§§ 25.1529, 25.1535 and K25.2.2(c) of appendix K of part 25

Regulation(s) requiring an ELOS finding

§§ 25.1535 and K25.2.2(c) of appendix K of part 25

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

The compensating factors that provide an ELOS for the regulations not complied with are as follows:

- Over 70% of maintenance procedures for ETOPS significant systems are validated as of the ELOS request,
- The FAA has witnessed the Airbus maintenance procedure validation process through reviews and maintenance activities performed on Model A350 airplanes,
- Validation of Group 1 ETOPS significant systems maintenance procedures will be accomplished prior to FAA ETOPS type design approval, and the remainder of the maintenance procedure validations for ETOPS significant systems will be completed prior to the Model A350 entry into service,
- No US-registered Model A350 airplanes will be used for ETOPS prior to full completion of validation of all maintenance procedures for ETOPS significant systems.

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

Although noncompliant with § 25.1535 and section K25.2.2(c) of appendix K of part 25, the compensating factors above provide an ELOS by having a rigorous process to ensure maintenance procedures for ETOPS significant systems will not result in an ETOPS diversion or fail to protect the safety of the airplane and occupants during an ETOPS diversion. Airbus accomplishes these compensating factors in their validation process, validation of all maintenance procedures for Group 1 ETOPS significant systems and of the majority of all ETOPS significant systems prior to Early ETOPS approval, and the validation of all remaining maintenance procedures for ETOPS significant systems prior to entry into service of the Model A350 airplane, including US-registered airplanes.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in project Issue Paper EE-7, titled Validation of Maintenance Procedures for ETOPS Significant Systems. 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 in accordance with the statement below:

Equivalent Level of Safety Findings has been made for the following regulation(s):
 § 25.1535 ETOPS approval, and
 § K25.2.2(c) of appendix K of part 25 Maintenance and operational procedures
 (documented in TAD ELOS Memorandum TC0544IB-T-EE-7)

Original signed by

Victor Wicklund

October 30, 2014

Transport Airplane Directorate,
Aircraft Certification Service

Date

ELOS Originated by: Propulsion & Mechanical Systems Branch	Project Engineer: Doug Bryant	Routing Symbol: ANM-112
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