



Federal Aviation Administration

Memorandum

Date: November 23, 2015

To: Manager, Boeing Aviation Safety Oversight Office, ANM-100B

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Jim Voytilla, ANM-100B

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Fire Safety Requirements for the Aft Strut Fairing Compartment on Boeing 787-8/-9/-10 (Project Nos. TC6918SE-T, PS06-0496, PS06-0497, PS13-0546 and PS14-1031)

ELOS Memo#: TC6918SE-T-P-3

Regulatory Ref: §§ 25.1182 and 25.1183

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 Boeing Model 787-8 airplane.

This memo was subsequently revised to extend this ELOS to the Boeing Model 787-9 and 787-10 airplanes.

Background

Title 14, Code of Federal Regulations (14 CFR) 25.1182 requires most of the requirements applied to fire zones defined by § 25.1181 to also be applied to nacelle areas behind firewall and to each portion of engine pod attaching structures containing flammable fluid lines. The intent of § 25.1182 is to set a level of required fire protection in areas adjacent to engine fire zones to limit the potential for engine fires to spread to those areas and to limit the hazard if fire does spread to those areas.

Section 25.1182 requires each portion of any engine pod attaching structure containing flammable fluid lines to meet the requirements of §§ 25.1103(b), 25.1165(d) and (e), 25.1183, 25.1185(c), 25.1187, 25.1189, and 25.1195 through 25.1203.

Section 25.1183(a) requires "...each line, fitting or other component carrying flammable fluid in any area subject to fire conditions...must be fire resistant, except that flammable fluid tanks... must be fireproof".

Boeing has proposed a 787-8 aft fairing compartment design which contains several hydraulic system components and a hydraulic system reservoir which have not been shown to meet their respective fire resistance/proof requirements and therefore the design does not directly comply with the portion of § 25.1182(a) that requires compliance with section § 25.1183(a).

Applicable regulation(s)

§§ 25.1182 and 25.1183

Regulation(s) requiring an ELOS finding

§ 25.1182(a)

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

The aft strut fairing is isolated from the engine fire zones by firewalls and a dry zone. It is located aft and above the engine core aft vent. The forward station of the aft strut fairing is located above and about 2 1/2 feet aft of the nearest engine firewall and protected by the fan and core cowl firewall extensions.

The aft fairing compartment close to the engine and engine exhaust is closed off by strut structure and a vapor seal. Seals are used to prevent exhaust gases from entering the aft fairing compartment. Metallic drains allow any spilled fluids to safely drain overboard.

Explanation of how design features or alternative Methods of Compliance (MoC) provide an ELOS to the level of safety intended by the regulation

The engine pod attaching structure design provides isolation of the aft fairing compartment from the engine fire zones by use of intervening compartments and physical distance from the fire zone.

The additional fire risk created by the non-compliant components is compensated for by the reduced risk of an engine fire zone fire heating or progressing into the aft fairing compartment due to the physical isolation of the aft strut fairing compartment from the fire zone and flammable fluid design features of the compartment.

FAA approval and documentation of the ELOS finding:

The FAA has approved the aforementioned ELOS finding in project Issue Paper P-3 or Administrative Collector Issue Paper G-6. This memorandum provides standardized

documentation of the ELOS finding that is nonproprietary 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. This ELOS memorandum number must be listed in the type certificate data sheet under the certification basis section.

An example of an appropriate statement is provided below.

ELOS findings have been made for the following regulation(s):

Portion of Section 25.1182(a), that requires compliance with section 25.1183(a); Fire Safety Requirements for the Aft Strut Fairing Compartment (documented in ELOS Memo TC6918SE-T-P-3)

 <hr style="border: 0; border-top: 1px solid black; margin: 0;"/> Transport Airplane Directorate, Aircraft Certification Service	<hr style="border: 0; border-top: 1px solid black; margin: 0;"/> 12/3/2015 Date
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ELOS Originated by Seattle ACO:	Project Engineer Sue Lucier	Routing Symbol ANM-160S
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