Federal Aviation Administration

Memorandum

Date: February 3, 2011

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

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Douglas Bryant, ANM-112

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for the Airbus Model A350 airplane (FAA Project Number TC0544IB-T)

ELOS Memo#: TC0544IB-T-P-24

Reg. Ref.: § 25.979(b)(1)

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 airplane.

Background

Title 14 Code of Federal Regulations (CFR) 25.979(b)(1) requires that the automatic shut-off means of the pressure fueling system be checked for proper shut-off operation before each fueling of the tank.

The Model A350 has an automatic system to control the refueling of the aircraft. Upon selection of refuel and before fuel flows onto the aircraft, all system sensors (probes, level sensors) associated with refuel are automatically checked to confirm there are no failures which would prevent shut-off. During this check the tank inlet valves, which serve as the actual shut-off means, are, however, not mechanically cycled open/close/open. Therefore the proposed automatic refueling shut-off system does not directly comply with § 25.979(b)(1).

Applicable regulation(s)

§ 25.979(b)(1)

Regulation(s) requiring an ELOS finding

§ 25.979(b)(1)

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

In addition to the normal shut-off means of the pressure fueling system, the A350 will feature an additional automatic shut-off capability that uses independent sensors, located in the surge tank. In the event of them becoming wet, they will cause the refuel isolation valve, located within the refuel coupling, to close and stop fuel entering the aircraft. The control system and sensors associated with this system are implemented such that there is no damage to the fuel system equipment, no overpressure of the tanks or fuel spillage from the aircraft in the event of a failure of the normal re-fuel shut-off system.

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

Although noncompliant with the regulation, the addition of the secondary automatic shut-off system is considered to provide adequate compensation for the lack of the required complete systems operational check of the normal shut-off means prior to each fueling of the tank. Therefore the overall pressure fueling system, with an automatic check of the normal fuel system sensors and the additional automatic shut-off system, is considered to provide an equivalent level of safety to direct compliance to § 25.979(b)(1).

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned equivalent level of safety finding in the Model A350 project issue paper P-24, titled "Pressure Fueling System Shut-off Operation check." 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):
14 CFR 25.979(b)(1), Pressure fueling system
(documented in TAD ELOS Memo TC0544IB-T-P-24)

Manager, Transport Airplane Directorate,
Aircraft Certification Service

FEBRUARY 11, 2011
Date

ELOS Originated by Transport Standards Staff:	Project Engineer Douglas Bryant	Routing Symbol ANM-112