Federal Aviation Administration

Memorandum

Date: January 15, 2013

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

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Todd Martin, ANM-115

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Pressurized Compartment Loads on Airbus Model A350 series airplanes, FAA Project Number TC0544IB-T.

ELOS Memo#: TC0544IB-T-A-8

Reg. Ref.: § 25.365

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 aircraft.

Background

The Airbus Model A350 design includes a cabin pressure control system (CPCS) that employs an active, multiply redundant system concept to limit the cabin pressure differential. Airbus intends to demonstrate that elements and protections of the compensating features provided by this system make zero cabin pressure differential extremely improbable at certain altitudes.

Airbus has requested an equivalent level of safety finding to Title 14, Code of Federal Regulations (14 CFR) section 25.365(a) rather than comply with the current applicable regulation. FAA accepts the Airbus proposal as equivalently safe.

Applicable regulation
§ 25.365

Regulation requiring an ELOS finding
§ 25.365(a)

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

Section 25.365(a) states: "The airplane structure must be strong enough to withstand the flight loads combined with pressure differential loads from zero up to the maximum relief valve setting."

Airbus requests an equivalent level of safety finding in lieu of direct compliance with the zero pressure differential requirement of § 25.365(a). Airbus intends to demonstrate that the CPCS will ensure that zero cabin pressure differential is extremely improbable at certain altitudes, and therefore need not be considered.

For compliance with § 25.365(a), Airbus proposes to define the "maximum relief valve setting" as the maximum positive pressure allowed by the CPCS overpressure relief function. For the limit load condition, Airbus proposes to combine limit flight loads with this maximum positive pressure value. For the ultimate load condition, Airbus proposes to combine the limit flight loads multiplied by a safety factor of 1.5, and the pressure differential loads multiplied by a safety factor of 1.25.

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

The FAA accepts the ELOS request with regard to the zero differential pressure condition. We agree that the compensating factors provided by the CPCS provide an equivalent level of safety with the zero pressure differential requirement of § 25.365(a).

The FAA accepts the ELOS request with regard to the proposed definition and use of "maximum relief valve setting." In addition, Airbus will demonstrate that the CPCS reliability ensures that a failure condition that would result in the pressure exceeding the "maximum positive pressure allowed by the overpressure relief function" is extremely improbable.

The FAA considers the Airbus proposal to be equivalently safe to the currently effective § 25.365(a).

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in project Issue Paper A-8, titled Pressurized Compartment Loads. 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:

An ELOS finding has been made for the following regulation:
§ 25.365(a) Pressurized Compartment Loads (documented in TAD ELOS Memo TC0544IB-T-A-8).

Original signed by
Suzanne Masterson

Transport Airplane Directorate,
Aircraft Certification Service

January 17, 2013
Date

ELOS Originated by Transport Standards Staff:	Project Engineer Todd Martin	Routing Symbol ANM-115