U.S. Department of Transportation

Federal Aviation Administration

Memorandum

Subject:	INFORMATION: Equivalent Level of Safety Finding for Airbus Model A380-800 FAA Project Number CP101	Date:	20 September 05
		Reg Ref:	§ § 25.341(a)(i) and (b), 25.343(b)(1)(ii), 25.345(c)(2), 25.371, 25.373(a), 25.391 and 25.1517.
From:	Manager, Transport Standards Staff, Airframe/Cabin Safety Branch, ANM-115	Reply to Attn of :	Rich Yarges ANM-115
To:	Manager, Transport Standards Staff, International Branch, ANM-116	ELOS Memo #:	CP101-A-09

Background

The Model A380-800 airplane will be an all-new, four-engine jet transport airplane with a full double-deck, two-aisle cabin. The maximum takeoff weight will be 1.235 million pounds with a typical three-class layout of 555 passengers.

Airbus has requested an equivalent safety finding to the existing continuous turbulence requirements of § 25.341(b) and the related rough air speed requirement of § 25.1517. Airbus proposes to use a recently harmonized set of design criteria for gust design loads arising from continuous turbulence. Regulations §§ 25.343, 25.345, 25.371, 25.373, and 25.391 are also modified by the harmonized regulations, since they contain references to § 25.341. The FAA accepts the Airbus proposal as equivalently safe.

Applicable regulation(s)

§ § 25.341(a)(i) and (b), 25.343(b)(1)(ii), 25.345(c)(2), 25.371, 25.373(a), 25.391 and 25.1517.

Regulation(s) requiring an ELOS

§ § 25.341(a)(i) and (b), 25.343(b)(1)(ii), 25.345(c)(2), 25.371, 25.373(a), 25.391 and 25.1517.

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

Recent measurements of derived gust intensities in actual operation show that the current continuous turbulence requirements do not accurately account for the distribution of gust intensities in the atmosphere for modern transport airplane operations. The Aviation

Rulemaking Advisory Committee (ARAC) has recommended new criteria for continuous turbulence design loads. Furthermore, the National Transportation Safety Board (NTSB) issued Safety Recommendation A-93-137, concerning the potential for combined vertical and lateral discrete gusts for airplanes with wing mounted engines when operating in continuous turbulence.

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

The criteria recommended by ARAC addresses the NTSB recommendation and improves the requirements for continuous turbulence by revising the turbulence intensity criteria, eliminating the mission analysis method, and providing a multi-axis discrete gust criterion for airplanes with wing mounted engines. Although the rulemaking on this regulation is not complete the FAA considers the ARAC proposal to be equivalently safe to the currently effective. § § 25.341(a)(i) and (b), 25.343(b)(1)(ii), 25.345(c)(2), 25.371, 25.373(a), 25.391 and 25.1517.

FAA approval and documentation of the ELOS

The FAA has approved the aforementioned Equivalent Level of Safety Finding in project issue paper A-9. This memorandum provides standardized documentation of the ELOS 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. An example of an appropriate statement is provided below.

Equivalent Safety Findings have been made for the following regulation(s):

§ 25.341(a)(i) and (b)	Gust and Continuous Turbulence Loads
§ 25.343(b)(1)(ii)	Design Fuel and Oil Loads
§ 25.345(c)(2)	High Lift Devices
§ 25.371	Gyroscopic Loads
§ 25.373(a)	Speed Control Devices
§ 25.391	Control Surface Loads: General
§ 25.1517	Rough Air Speed, V_{RA}

(documented in TAD ELOS Memo CP1-1-A-09)]

Original Signed by Franklin Tiangsing — *September 20, 2005*

Manager, Transport Standards Staff, Airframe/Cabin Safety Branch, ANM-115 — Date

ELOS Originated by TSS:	Project Engineer Rich Yarges	Routing Symbol ANM-115