U.S. Department of Transportation

Federal Aviation Administration

Memorandum

Subject:	Information: Equivalent Level of Safety Finding for Gulfstream Models GV-SP and GIV-X FAA Project Number Nos. AT5177AT-T and AT5080AT-T, respectively.	Date:	May 25, 2004
		Reg. Ref:	§25.841(b)(6)
From:	Manager, Propulsion and Mechanical Systems, ANM-112	Reply to Attn of:	Joe Jacobsen, ANM-113
To:	Manager, Atlanta ACO, ACE-115 A	ELOS Memo #:	AT5177AT-T-S-29

Background

FAR 25.841 (b)(6) requires a warning when a safe or preset cabin pressure altitude limit is exceeded. The rule states that the warning requirement for cabin pressure altitude limits may be met if the warning is set for 10,000 feet. Gulfstream intends to certify the Models GV-SP and GIV-X for takeoff and landing at airports with field elevations up to 15,000 feet. If the cabin altitude warning is set for 10,000 feet the flight crew will receive nuisance warnings during high altitude takeoff and landing operations unless special design features are incorporated. Accordingly, Gulfstream has designed the GV-SP and GIV-X Pressurization Control Systems to inhibit the cabin pressure altitude warnings under specific conditions for these high altitude operations. Gulfstream has requested an equivalent level of safety to FAR 25.841 (b)(6) under certain operating conditions so as to allow incorporation of these design features.

Applicable regulation(s)

§§25.841(b)(6)

Regulation(s) requiring an ELOS

§25.841(b)(6) at Amendment 25-87

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

The intent of § 25.841 (b)(6) is to warn the crew when the safe or preset cabin pressure altitude limit is exceeded. The FAA has determined that the safe cabin altitude can be above 10,000 feet when operating into a high altitude airport, provided there is a means to warn the crew when the cabin altitude exceeds the field elevation by some margin and the system reverts back to the normal cabin altitude warning setting for all other operations. The FAA Approved Airplane Flight Manual (AFM) must include appropriate limitations and procedures. The FAA has determined that when operating with the cabin altitude warning shifted to an altitude above 10,000 feet, at least one pilot is required to use

oxygen continuously during descent. In addition, the AFM shall contain information regarding the operation of the cabin altitude warning system when operating into the high altitude airfields.

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

For Landing Field Elevations (LFE) greater than 7,500 ft and less than 9,500 ft, the Cabin Pressure Low Warning is set to 10,000 ft. Therefore, for LFE less than 9,500 ft and for cruise above 34,000 ft, the Cabin Pressure Low Warning is fully compliant with the requirements of §25.841 (b) (6).

For LFE greater than 9,500 ft (up to 15,000 ft LFE), the Cabin Pressure Low Warning is set to 14,500 ft during descent. During take-off and climb the Cabin Pressure Low Warning can start as high as 15,000 ft and is reset towards 8,000 ft as a function of the cabin pressurization rate. This minimizes the exposure of the crew to a Cabin Pressure Low Warning of 14,500 ft.

Gulfstream has included AFM procedures to advise the pilots that the Cabin Pressure Low Warning is reset as a function of the LFE and that one pilot must wear an oxygen mask from the top of descent whenever the LFE is greater than 9,500 ft. Additionally, the GV-SP and GIV-X AFMs will require oxygen use during ground operation and during climb when departing from an airport where the LFE is greater than 9,500 ft.

The FAA agrees that this Cabin Pressure Low Warning design in combination with the requirement for a member of the flightcrew to use oxygen at LFE altitudes greater than 9,500 ft is an equivalent means of addressing FAR 25.841 (b) (6).

FAA approval and documentation of the ELOS

The FAA has approved the aforementioned Equivalent Level of Safety Finding for the GV-SP in Issue Paper S-29. Because the applicable portion of the GIV-X design is identical to that of the GV-SP, the Equivalent Level of Safety Finding in Issue Paper S-29 for the GV-SP is also fully applicable to the GIV-X. 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 (TC's & ATC's) or on page 3 of the STC Certificate. [e.g., Equivalent Safety Findings have been made for the following regulation(s): §§25.841(b)6) Pressurized cabins (documented in TAD ELOS Memo No. AT5177AT-T-S-29)].

Original signed by Neil D. Schalekamp — 5/25/04

Manager, Propulsion and Mechanical Systems, ANM-112 — Date

ELOS Originated by:	Program Managers:	Routing Symbol:
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