



Federal Aviation Administration

Memorandum

Date: October 24, 2011

To: Manager, Atlanta Aircraft Certification Office, ACE-115A

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Darby Mirocha, ACE-118A

Subject: **INFORMATION**: Equivalent Level of Safety Finding for the Auxiliary Power Unit (APU) Installation on Gulfstream Model GVI Series Aircraft (FAA Project Number TC8700AT-T)

Memo No: TC8700AT-T-P-3

Reg. Ref.: §§ 21.21(b)(1); 25.901(c)(d); 14 CFR part 25 subpart E, F, and G

The purpose of this memorandum is to inform 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 Gulfstream Model GVI series of aircraft. This memorandum has been revised to correct the referenced applicable regulations and update the airplane model number.

Background

Gulfstream has requested to adopt the proposed Title 14, Code of Federal Regulations (14 CFR) part 25 new Appendix K requirements for the Model GVI Auxiliary Power Unit (APU) installation rather than comply with the current 14 CFR part 25 subpart E, F, and G applicable airworthiness regulations. The proposed Appendix K (draft Joint Aviation Requirements (JAR) 25 subpart J) APU requirements are defined in the draft FAA Notice of Proposed Rulemaking (NPRM), Rulemaking Team Draft, dated April 2001.

Applicable regulation(s)

§§ 21.21(b)(1); 25.901(c)(d); 14 CFR part 25 subpart E, F, and G

Regulation(s) requiring an ELOS

14 CFR part 25 subpart E, F, & G requirements currently applicable to APU installations (except 14 CFR 25.901(c))

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

Since the introduction of APUs into transport category commercial aircraft, 14 CFR part 25 requirements have been applied to both APUs and main engines. When part 25 was originally promulgated, APUs were not common in transport category airplanes. Since that time, APUs have become widely utilized in these aircraft.

Advances in APU technology include electronic control systems which allow unattended APU operation, minimal monitoring by the flight crew during APU operation in-flight, and automatic shutdown features for parameter limit exceedance events. In addition, software control of functions previously handled by hydro-mechanical hardware has become common. Aircraft interface with the APU control system has also evolved with the advances in APU technology. This situation has resulted in an increased number of ELOS findings per the provisions of § 21.21(b)(1).

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

The proposed Appendix K requirements in the draft FAA NPRM, Rulemaking Team Draft, dated April 2001, are harmonized with the proposed JAR 25 subpart J as defined in Notice of Proposed Amendment (NPA) 25J-300 Issue 0 (November 1998, revised 14 December 2001). These requirements, with JAR J/FAR K25.901(d) modified to read the same as the current 14 CFR part 25, subpart E § 25.901(c), inherently represent a more stringent set of APU installation requirements than the relevant regulations within the currently applicable Gulfstream GVI certification basis. Additionally, the EASA Certification Specification (CS) 25, Amendment 2, Subpart J is equivalent to JAR 25, subpart J as referenced in the FAA NPRM. Hence, if Gulfstream acceptably demonstrates that the GVI APU installation complies with the EASA CS 25, Amendment 2, subpart J, (except that compliance will also be demonstrated to the current 14 CFR for § 25.901(c), noted significant regulatory difference), it inherently demonstrates an equivalent (or possibly increased) level of safety compared to direct compliance with the currently applicable 14 CFR part 25 APU installation regulations.

FAA approval and documentation of the ELOS

The FAA has approved the aforementioned ELOS finding in project Issue Paper P-3. This memorandum provides standardized documentation of the ELOS 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. 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):

14 CFR part 25 subpart E, F, & G requirements currently applicable to APU installations (except for 14 CFR 25.901(c)) (Documented in TAD ELOS Memo TC8700AT-T-P-3).

Original Signed by

Victor Wicklund for

Manager, Transport Airplane Directorate,
Aircraft Certification Service

October 28, 2011

Date

ELOS Originated by ACO:	Darby Mirocha, ACE-118A	
-------------------------	-------------------------	--