Proposed Deviations against CS 25.901(c) - 'Powerplant installation'

Applicable to Gulfstream Model GVI.

Introductory Note

The hereby presented two Deviations shall be subject to public consultation, in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) of which states:

"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency".

Statement of Issue.

The CS 25.901(c) requirement states "*The powerplant installation must comply with CS 25.1309, except that the effects of the following need not comply with 25.1309(b) :*

(1) Engine case burn through or rupture;
(2) Uncontained engine rotor failure; and
(3) Propeller debris release."

Issues with Gulfstream model GVI intended compliance with this CS 25.901(c) requirement have been identified on :

- **Throttle Quadrant Jam.**
- **Fuel Metering Valve Jam.**

Gulfstream Model GVI –Deviation E-18
CS 25.901(c) - 'Powerplant installation'

Throttle Quadrant Jam

The Applicant has confirmed that CS 25.901(c) compliance for the RTO case cannot be demonstrated for certain extremely remote single point failures in the throttle quadrant. Because of the degree of redesign required to eliminate the possible mechanical issues, plus the relatively low risk that they pose, the Applicant has requested a deviation for those failures.

Considering that:

- The potential event has a very short exposure time;
- The Throttle Quadrant jam event has been shown to be extremely improbable;
- Service experience from GIV/GV aircraft supports the above analysis;
- Throttle box redesign is impractical and added complexity might introduce other hazards; and
- This standard has been accepted by FAA, the Certifying Authority, and on other large aeroplanes certificated by EASA;

A deviation with regards compliance with CS 25.901(c) for the Gulfstream model GVI can be granted by EASA.

Fuel Metering Valve Jam.
The Applicant has identified an extremely remote powerplant failure condition that could adversely affect safe operation in a very limited portion of the flight envelope on the GVI aircraft.
The Applicant and Engine Manufacturer have determined that, in order to correct this potential failure condition, a change to the Engine Electronic Control (EEC) software is required.
This updated software logic will initiate engine shutdown via the over-speed shut-off mechanism following detection of a fuel metering valve jam, while the aircraft is on the ground and when the affected engine throttle is retarded to idle.
The Applicant intends to incorporate installation of this modification on all previously delivered aircraft via an Aircraft Service Change (ASC) and within the four year timeframe of the EASA Deviation.

Considering that:

- The applicant has shown that a plan is in place to introduce FADEC software changes and provide retrofit to in-service aircraft within four years;
- The potential event has a very short exposure time; and
- The event has been shown to be extremely improbable;

A temporary deviation with regards compliance with CS 25.901(c) for the Gulfstream model GVI can be granted by EASA.