

**SUBJECT** : **“Abuse” Angle for Flare Demonstration**

**REQUIREMENTS incl. Amdt.** : **(SAL) 25.5 of Appendix Q of CS 25 amdt. 18**

**ASSOCIATED IM/MoC<sup>1</sup>** : Yes  / No

**ADVISORY MATERIAL** : **none**

**INTRODUCTORY NOTE:**

The following Equivalent Safety Finding has been classified as important and as such shall be subject to public consultation in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) 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."*

**IDENTIFICATION OF ISSUE:**

EASA has received an application to validate an FAA approval for Steep Approach operations for a large business jet.

During the initial approval, the FAA issued an Issue Paper (IP) which provides an Alternate Means of Compliance with 14CFR Part 25, §25.143(a)(5) to that provided in FAA Advisory Circular (AC) 25-7C Para 231.d.(1)(a)1. The IP allows, for approach path angles above 5.5 degrees, to demonstrate that the aeroplane is safely controllable and manoeuvrable during the flare to a landing using an approach path angle 1.5 degrees (so called ‘abuse’ angle) steeper than the steepest approach path angle for which approval is sought at the  $V_{REF}$  established for a steep approach, instead of 2 degrees steeper as provided in the AC 25-7C, if a 0 knot tailwind limitation is included in the Aeroplane Flight Manual (AFM) Supplement.

As validating authority EASA intends to follow the FAA’s approach, to reduce the “abuse” angle for the flare demonstration from 2 degrees to 1.5 degrees. However, CS-25 Appendix Q, paragraph (SAL)25.5 sets the 2 degrees ‘abuse’ angle as a specification within Book 1. Therefore, the EASA certification basis has to include an EASA Equivalent Safety Finding (ESF).

Considering all the above, the following Equivalent Safety Finding is proposed:

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<sup>1</sup> In case of SC, the associated Interpretative Material and/or Means of Compliance may be published for awareness only and they are not subject to public consultation.

**Equivalent Safety Finding - ESF-APPQ25.5-01 - to Appendix Q, (SAL) 25.5 of CS-25 Amdt 18 - "Abuse" Angle for Flare Demonstration**

## 1. APPLICABILITY

**Gulfstream Model GVI**

## 1.1 AFFECTED CS

**(SAL) 25.5 of Appendix Q of CS 25 amdt. 18**

## 2. JUSTIFICATION AND COMPENSATING FACTORS

Compensating factors:

The "abuse" angle used for the flare demonstration for approach path angles steeper than 5.5 degrees can be reduced from 2 degrees (as required by paragraph (SAL) 25.5 of Appendix Q of CS 25 amdt. 18) to 1.5 degrees, if a limitation is included in the Aeroplane Flight manual (AFM) to prohibit performing an approach when a tailwind component exists.

Justification:

Consistent with the Flight Test Harmonization Working Group (FTHWG) (established by the Aviation Rulemaking Advisory Committee in the USA) discussions and FAA Policy and Innovation Transport Standards Branch (f.k.a. Transport Airplane Directorate) inputs – Gulfstream is proposing abuse angle for flare demonstration/analysis be reduced by 0.5 degree with an AFM Supplement (AFMS) limitation of 0 kt tailwind for steep approach angles beyond 5.5 degrees. When combined with the AFMS limitation of no tailwind for steep approach angles beyond 5.5 degrees, the proposed 0.5 degree reduction in abuse angle for the flare demonstration does not alter the intent of the abuse case to show that the aeroplane is able to return to the desired flight path.

Gulfstream presented this information at both the FAA and EASA Familiarisation briefings for this project. Steep approach and landing capability will be demonstrated at an approach path angle of  $-7.5^\circ$ , which is  $1.5^\circ$  steeper than the steepest approach path angle ( $-6.0^\circ$ ) for which approval is sought.

Gulfstream will demonstrate approach path angle tracking capability under calm air conditions at  $-8.0^\circ$ , which is  $2^\circ$  steeper than the steepest approach path angle ( $-6.0^\circ$ ) for which approval is sought, and at the VREF established for a steep approach.