

**JAR NPA 25C-282**  
**DISCRETE GUST RULE CHANGES TO ALIGN JAR-25 WITH FAR PART 25**

**COMMENT DOCUMENT**

**INTRODUCTION**

This notice proposes a number of changes to SubPart C of JAR-25, to align JAR-25 with FAR Part 25, following agreements which have been made under the JAA/FAA Harmonisation Work Programme.

These proposals were developed in co-operation with the Federal Aviation Administration (FAA) of USA and the European, American and Canadian aviation industry through the Loads and Dynamics Harmonisation Working Group of the U.S. Aviation Rulemaking Advisory Committee (ARAC).

**JUSTIFICATION**

The FAA revised Discrete Gust Load Design Requirements were published in the Federal Register as a Final Rule on Friday, 9 February 1996. This amendment arose as a result of a harmonisation activity under the auspices of the Loads and Dynamics Harmonisation Working Group. Members of the JAA Structures Study Group (SSG) were fully involved in this harmonisation activity and the SSG fully supports the rule changes introduced into FAR.

The initial objective of the harmonisation activity was to provide for harmonisation of the FAR discrete gust requirements with those of the JAR. This objective has been achieved. However, to accommodate the FAA and to fit the standard FAR approach to requirements various grammatical changes, legal changes and re-organisations of JAR-25 texts and ACJ materials, were made during the harmonisation discussions. As a result, the JAR-25 Change 14 text needs to be changed to align with the new (harmonised) FAR 25 text.

The changes seem extensive, but do not significantly change the technical intent of the discrete gust requirements as written currently in Change 14.

**DISPOSITION OF COMMENTS**

A number of supportive comments were received indicating acceptance of the proposed amendments without change to the text. Other comments were considered in detail by the Structures Study Group (SSG) at its Meeting No. 97 held in Stockholm on 24-25 June 1997 and were resolved as follows:-

**COMMENT:** In 25.341(a)(4) the closing bracket in the formula  $U_{ds} = U_{ref} F_g \left( \frac{H}{350} \right)^{1/6}$  is missing.

**SSG RESPONSE:** Comment accepted. The closing bracket will be added.

**COMMENT:** In 25.341(a)(6) the closing bracket in the formula  $F_{gm} = \sqrt{R2 \tan \left( \frac{\pi R1}{4} \right)}$  is missing.

**SSG RESPONSE:** Comment accepted. The closing bracket will be added.

**COMMENT:** In JAR 25X1517 the minimum prescribed value for  $V_{RA}$  (not less than the minimum value prescribed for  $V_B$ , now based on  $V_{S1g}$ ) is higher than the minimum value presently adopted and based on  $V_{Smin}$ . That could lead to  $V_{RA}$  values not optimized (e.g. for climb performances). Therefore further analysis is needed on this point.

**SSG RESPONSE:** Comment accepted. The definition of the limits to  $V_{RA}$  is being further discussed by the ARAC Loads and Dynamics Harmonisation Working Group as part of the consideration of continuous turbulence loads requirements. The question of the lower bound to  $V_{RA}$  has been raised with the JAA Flight Study Group. This point will be covered in a future change following agreement of those groups. In the meantime the proposed text will be retained to maintain harmonisation with FAR Part 25.

**COMMENT:** General comment available in this NPA: we shall use SI units.

**COMMENT:** The units used in this NPA are Imperial. Metric equivalents should be used for consistency with other JAA standards and EC regulation.

**SSG RESPONSE:** Comment accepted. Metric units will be used where appropriate in accordance with JAA policy. However, the formulae used in JAR 25.335(d), JAR 25.341(a)(2), JAR 25.341(a)(4) and JAR 25.345(a)(2) are well established and universally recognised in their current form. These formulae will be retained as proposed.

**COMMENT:** It is noted that this NPA, that would affect flight aspects of JAR-25, has been published without consultation with the JAA Flight Study Group.

**SSG RESPONSE:** Comment noted.

**COMMENT:** In JAR 25.341(a)(2) the formula for  $U$  is incorrect, and should read

$$U = \frac{U_{ds}}{2} \left[ 1 - \cos\left(\frac{\pi s}{H}\right) \right]$$

**SSG RESPONSE:** Comment accepted. The formula will be so amended.

**COMMENT:** In JAR 25.341(a)(2) it is also suggested that the following statement should be included immediately after the formula for clarity, " $U=0$  for  $s>2H$ "

**SSG RESPONSE:** Comment accepted. This statement will be added.

**COMMENT:** In JAR 25.335(d) the definition of  $V_{S1}$  requires  $C_{NAmax}$  to be defined.

**SSG RESPONSE:** Comment accepted. A definition of  $C_{NAmax}$  will be added as follows: " $C_{NAmax}$  = the maximum aeroplane normal force coefficient."

**COMMENT:** The text of JAR 25.351 presented is based upon the existing text of JAR-25 at Change 14. As such it is inconsistent with the more recent harmonised changes introduced by NPA 25C-260. As a consequence, no changes should be made to the text of this paragraph other than those contained within NPA 25C-260.

**SSG RESPONSE:** Comment accepted. No changes will be made to this paragraph pending adoption of NPA 25C-260.

**COMMENT:** The text of JAR 25.371 presented is based upon the existing text of JAR-25 at Change 14. As such it is inconsistent with the more recent harmonised changes introduced by NPA 25C-260. As a consequence, no changes should be made to the text of this paragraph other than those contained within NPA 25C-260.

**SSG RESPONSE:** Comment accepted. No changes will be made to this paragraph pending adoption of NPA 25C-260.

**COMMENT:** Since ACJ 25X1517 has been subsumed into the proposed text of the revised requirement, the ACJ should be deleted.

**SSG RESPONSE:** Comment accepted. The ACJ 25X1517, and the cross reference to it, will be deleted.

**COMMENT:** In many areas, symbols such as Uds, Uref, Fg, Fgz, R1, R2, etc., are used. It would clarify the text and understanding of formulae if the descriptors ds, ref, g, gz, 1, 2, etc., were presented as proper subscripts.

**SSG RESPONSE:** Comment accepted. This will be highlighted to JAA Headquarters when the NPA is returned for publication.

**COMMENT:** The NPA makes no changes to JAR 25.261, but the intention to harmonise implies that the FAA will be adopting this paragraph for Part 25. In this case the "X" designation may be omitted. There is also an ACJ to 25X261, which should also be considered as part of any harmonisation with FAA.

**SSG RESPONSE:** Comment rejected. The "X" designation and the ACJ will be retained until the FAA do indeed adopt JAR 25.261.

**COMMENT:** The texts of JAR 25.333 and 25.373 presented are acceptable, but are actually unchanged from the existing text of JAR-25 at Change 14.

**SSG RESPONSE:** Comment accepted. However they will be retained to ensure that the underlining will now be removed.

**COMMENT:** In JAR 25.335, following the formula for  $\mu$ , the parameter g should be defined, as it is in FAR Part 25.

**SSG RESPONSE:** Comment accepted. A definition for g will be added.

**COMMENT:** The sentence "*The flight profile alleviation factor should be increased linearly from this value at sea level to a value of 1.0 at the Maximum Operating Altitude.*" Following the definition of  $Z_{mo}$  and immediately before 25.341(a)(7) is superfluous and should be deleted.

**SSG RESPONSE:** Comment accepted. This sentence will be deleted.

**COMMENT:** In JAR 25.341(c) the words "Not required for JAR" can be deleted, since they are not in FAR Part 25.

**SSG RESPONSE:** Comment accepted. The appropriate wording "Reserved" will be used.

**COMMENT:** Now that FAR Part 25 includes a paragraph 25.1517, the JAR paragraph 25X1517 can be presented without the X.

**SSG RESPONSE:** Comment accepted.

**COMMENT:** The material of 25.571, 25.1517 and part of 25.445 is duplicated.

**SSG RESPONSE:** Comment noted.

**COMMENT:** In JAR 25.345(c), clarification concerning negative load factors (as defined in JAR 25.337(c) for clean configuration) is recommended.

**SSG RESPONSE:** Comment accepted. However, this proposal goes beyond the scope of NPA 25C-282 which is intending to introduce only changes to harmonise with the current FAR 25. Therefore, no changes will be made at this point to accommodate this comment.