

JAR-25
Comment Document
NPA 25C-260
Load Requirements

1 Comments were received from the following:

*Aerospace Industries Association
British Aerospace (AVRO)
CAA Monaco
CAA UK
Daimler Benz Aerospace (Airbus)
DGAC France
General Aviation Manufacturers Association*

2 Background

NPA 25C-260 proposed to revise the structural loads design requirements of JAR-25 by incorporating changes developed in co-operation with the Federal Aviation Administration of USA, Transport Canada and the European, American and Canadian aviation industries through the Aviation Rulemaking Advisory Committee (ARAC). These proposals are intended to achieve common requirements and language between some of the structural requirements of the Joint Aviation Requirements (JAR-25) and part 25 of the Federal Aviation Regulations (FAR) without reducing the level of safety provided by the regulations.

3 Analysis of Comments

Three commenters supported the proposals without further comment. The other four commenters offered only limited comments, while generally supporting the proposal.

The following disposition of comments has been co-ordinated with the FAA to ensure common actions and to maintain a harmonised result.

Comment

'It is a general comment about the units used in this NPA. We shall use the SI units according to the ICAO Annex 5.'

Sponsors Reply

The sponsors will accept SI units or dual SI (U.S.) units in accordance with JAA standard policy and procedures. However, some structural formulae have been well established over many years and are universally recognised in their U.S. form. These formulae will be retained unchanged to retain familiarity.

Comment

For future consideration, we would like to note for the record that the required minimum speed V_{L1} in 25.479 (Level Landing Conditions) is not a rational level landing condition. Also, 25.473(d) states: 'The limit inertia load factors corresponding to the required limit descent velocities must be validated by tests as defined in Sec. 25.723(a).' There is currently another NPA/NPRM dealing with 25.723 which will eliminate the requirement for validating limit load. NPAs/NPRMs should be co-ordinated.

Sponsors Reply

Points noted. The reference to limit inertia load factors in JAR 25.723(a) will be addressed by another NPA in the near future.

Comment

The present proposal does not amend the final paragraph of the section [JAR 25.481(a)], which reads: 'The combination of vertical and drag components specified in JAR 25.479(c)(1) and (3) is

considered to be acting at the main wheel axle centreline.’ We recommend that the quoted text is deleted.

Sponsors Reply

The comment is correct. The rule will be adopted as proposed except that the incorrect references will be deleted.

Comment

The headline states ‘... and deleting ACJ 25.331(c)(2).’ This is related to checked manoeuvres, which are still subject to agreement by FAA and are not part of the NPA. Therefore this ACJ 25.331(c)(2) has to be kept until the checked pitching manoeuvre requirement is agreed by FAA and hence recorded in a forthcoming NPA.

Sponsors Reply

Agreed. ACJ 25.331(c)(2) will be retained, pending further NPA action on checked pitching manoeuvre requirements.

4 Further Harmonisation Considerations

As a result of comments made against the FAA Notice of Proposed Rulemaking (NPRM 95-14 Revised Structural Loads Requirements for Transport Category Airplanes) changes were introduced into the final rule for §25.415. These changes have led to a difference in text between the proposed FAR 25.415 and the proposed JAR 25.415 as contained within NPA 25C-260. For the record the FAA discussion for disposition of these comments is given below:

‘One commenter believes the changes proposed for §25.415 could be a burden for some airplanes that are derived from models that were certified to earlier amendment levels of the FAR and JAR. To provide relief for these derivative airplanes, the commenter proposed a change to paragraph (b) of §25.415 which would allow the use of ‘rational’ aerodynamic hinge moment coefficients for control surfaces in lieu of the prescribed coefficients of paragraph (b). The FAA does not agree that there is likely to be a burden for derivative airplanes since the proposed rule applies to new designs. In addition, the design gust speed, when considering both part 25 and JAR-25, has not actually changed. Although §25.415, ‘Ground gust conditions’, was identical in part 25 and JAR-25, Notice 95-14 proposed to increase the ground gust velocity from the current maximum of 88 feet per second (about 52 knots) to 65 knots. Section 25.519 of JAR-25 already prescribes a 65-knot wind speed for ground gusts during jacking and tie-down and specifically requires these gusts to be applied to the control surfaces. The ARAC recommended, with FAA and JAA concurrence, that ground gusts on control surfaces be addressed in just one section, §25.415, so Notice No. 95-14 proposed to revise this section to achieve the same effect as the §25.519 of JAR-25 by incorporating the 65-knot wind speed into §25.415. The net effect is that there is no change in the ground gust speed requirement for control surfaces over that already required by JAR-25.

Furthermore, the use of rational aerodynamic hinge moment coefficients would necessitate a rational ground gust speed as well, and the 65-knot design gust speed is not necessarily a rational design speed for ground gusts. Jet blasts in airport operations and normal storm conditions often exceed 65 knots but service history has shown that the 65 knot design speed when combined with the conservative prescribed hinge moments of paragraph (b) provides a satisfactory design.

Two commenters recommended that the formulation of the requirement for hinge moments in §25.415 be changed to show the 65 knot wind speed explicitly rather than embedding this value into the multiplying constant. The FAA agrees that this has merit since the connection between the 65 knot wind speed of sections 25.415 and 25.519 could otherwise be missed in any future rulemaking actions. The rule is adopted as proposed except for changes to show the 65 knot wind speed explicitly in the formula for control surface hinge moments.’

JAA Sponsors Position

The FAA proposal to re-formulate the equation of §25.415 is rational and does not affect the safety level intended by the rule. Therefore, for consistency, it is proposed to adopt the following text for JAR 25.415(a)(2):

§25.415 *Ground gust conditions*

(a) * * *

(1) * * *

(2) *The control system stops nearest the surfaces, the control system locks, and the parts of the systems (if any) between these stops and locks and the control surface horns, must be designed for limit hinge moments H, in foot pounds, obtained from the formula,*

$$H = .0034KV^2cS,$$

*where –**V = 65 (wind speed in knots)**K = limit hinge moment factor for ground gusts derived in sub-paragraph (b) of this paragraph.**c = mean chord of the control surface aft of the hinge line (ft);**S = area of the control surface aft of the hinge line (sq. ft);*

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