JAR-22 SAILPLANES AND POWERED SAILPLANES	Sponsor CAA UK	NPA 22C&D-86 Issue 2 27 September 2001

INCONSISTENCY OF STRUCTURAL STRENGTH REQUIREMENTS
NPA to Amend 22.345(a)(1) and 22.697(c)(2)

THE COMMENTS AND RESPONSES

Comments were received from CAA UK and ACG:

1. CAA UK

1.1 CAA Comment no 1

1.1.1 CAA UK Comment No 1 was:

The proposal specifies the structure including the airbrake system must be designed to the manoeuvre load factor conditions. It is not clear why the airbrake system is highlighted in this way, and it may be read that the airbrake system is a special case. CAA believes that it is equally important that the flying control systems are designed to these conditions, because if they fail during these manoeuvres then there is no scope to use the control surfaces for the recovery

1.1.2 Study Group Response to CAA UK Comment No 1:

The Study Group rejected this comment because the NPA is only intended to rationalise three requirements (22.143(a), 22.345(a)(1) and 22.697(c)(2)). The requirements for the rest of the control system are consistent and covered elsewhere in JAR 22. There is not a problem with 22.143(a) for the rest of the control system; but there is a known problem with the airbrake deployment, and that is what this NPA is intended to address.

1.2 CAA Comment No 2

1.2.1 CAA UK Comment No 2 was:

This NPA addresses the effects of airbrake deployment on the loading of the airframe due to transient manoeuvres arising from their deployment. Generally this is an improvement on the last draft in that reference to 'without causing structural damage' has been removed and the normal limit and ultimate load conditions are allowed to prevail.

A problem has arisen regarding the level of negative load factor to be considered. The original concern was that a flight test revealed a qualitatively assessed transient of -2g to have occurred in one case. The discussion of this value led to some claims that the brakes were only ever used under controlled descent conditions and that the value from the test flight was too high based on the subjective views of the Study Group. Firstly there is no restriction on the use of brakes and they and the airframe should therefore be designed for any condition occurring within their allowed envelope of deployment. Secondly, rather than arbitrarily reduce the value of a 'n' to be considered, some basic parametric modelling should be performed to identify a worst case scenario and the requirement should be written in terms of 'the negative

load factor shall be 2 unless rational analysis shows that exceedance of this value is impossible within the normal envelope of airbrake deployment.

1.2.2 Study Group Response to CAA UK Comment No 2:

The figure of -1.5g was chosen because there is then a range of +/-2.5g around the 1g straight-and-level figure, giving a range of +3.5 to -1.5g with airbrake deployment. In addition, the NPA 22B-71 Comment/Response Document refers to tests carried out that justify -1.5g; this matter was covered in some detail. This comment was therefore rejected.

1.3 CAA Comment No 3

1.3.1 CAA UK Comment No 3 was:

This proposal is numbered NPA 22C&D-86 but in the title is referred to as a P-NPA. Clarification is sought on what stage this proposal is at?

This proposal and NPA 22D-82 address the same paragraph at the same tome. This method of working is potentially dangerous and the JAR 22 Study group should combine the two NPAs into one and ensure that the proposal is clear.

1.3.2 Study Group response to CAA UK Comment No 3:

The first comment is editorial, this is of course an NPA, not a PNPA. This comment was accepted. NPA 22B-71 needs to have an editorial amendment to reflect NPA 22D-82. It is similarly agreed that this NPA is incorrect in referring to Va in paragraph 22.697(c)(2), which should have 'Va' replaced by 'Vt or 1.8Vs1'. This comment was also accepted, but it is not proposed to combine the two NPAs because there are different sponsors of 22D-82 and C,D-86.

2. ACG

2.1 The ACG general comment was:

The proposal covers only one more item of the brake flap actuation. The extension time seems to be a driving factor in this problem, which at all is not fully addressed. Hand force gradient changes in a very short time (-20daN to +20daN extreme) shall be avoided. Unexpected extension must not cause full extension in a very short time, consequent high g loads.

2.2 Study Group Response to ACG Comment:

The comment refers to rate of deployment of airbrakes and the handforces, but the NPA is accepted by ACG.

3. 'No comment' responses were received from LBA, DCA Malta and CAA-Denmark

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