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DATE November 8, 1999
YOUR REFERENCE Docket No. FAA-I 999-6063- 5
OUR REFERENCE AI/EA-A 412.0697/99
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U.S Department of Transportation Dockets
Docket No. FAA-I 999-6063
400 Seventh Street SW.
Room Plaza 401
Washington DC 20590
U.S.A.

SUBJECT: NPRM 99-16, Revision of Braking Systems Airworthiness Standards; Related Proposed Advisory Circular 25.735-1X

Dear Sirs,

Airbus Industrie thanks the FAA for this opportunity to comment on the proposed harmonized standards on braking systems.

We support and promote the general intent of harmonizing FAR Part 25 and JAR-25. However, in this case, we are concerned with some aspects of the proposed rule, that create significant additional constraints on braking system design and other systems architecture, and on compliance demonstration, without any clear safety benefit.

In particular, the *Summary of Costs and Benefits*, in the NPRM preamble, indicates a type certification testing cost increase from $20,000-$60,000, resulting from proposal 11 on "most severe landing stop", that would be balanced by the savings expected from rule harmonization. Then this summary adds considerations on potential safety benefits:

> "Although there were numerous (approx. 170) accidents involving brake failures during landings in the period 1982-1995, none were determined to have been directly preventable by the subject provisions. Different designs in future type certifications, however, could present other problems (unexpected) and raise future accident rates."

In fact the expected safety benefit is so vague that it is hard to justify the additional certification expenses, even if balanced by administrative simplifications, especially for a technically questionable requirement.

Our detailed technical comments are attached to this letter. Comments on related sections of AC 25.735-I X are also provided.

The same comments will be sent, as applicable, to the JAA on NPA 25D-291, as we expect that comments on NPRM 99-16 and NPA 25D-291 will be disposed of jointly, and that the final rules and advisory material will be kept harmonized.

Yours sincerely,

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ATTACHMENT TO AI/EA-A 412.0697/99, Nov 8, 1999

DETAILED TECHNICAL COMMENTS ON NPRM 99-16 AND AC 25.735-1X

Proposal 3:

The NPRM proposes to delete the parenthetical phrase "(excluding the operating pedal or handle)" in §25.735(b)(1), "because no justification could be found for such an exclusion". In fact this exclusion was justified by the following considerations:

- If one pedal is jammed at 0°, maximum braking cannot be continuously applied on the other side, for obvious lateral control reasons;
- However maximum asymmetric braking capability is needed to cope with other failure scenarios (such as rudder jam at high deflection).

Compliance with the doubled stopping distance requirement can only be shown, in this jammed pedal case, by use of auto-brake mode and/or thrust reversers.

Proposal 1 I:

Contrary to what is indicated in the Regulatory Evaluation Summary, the Most Severe Landing Stop (MSL) requirement has not been in effect in Europe per British CAA, and there is no evidence that "many large part 25 airplane manufacturers currently meet this standard". JAR-25 does not contain this concept. Before JAR-25 adoption, BCAR Section D was the U.K. certification code for large airplanes. The brake energy absorption capacity was based on different concepts, namely Certified Normal Brake Energy Capacity and Certified Emergency Brake Energy Capacity (BCAR chapter D-4-5, 53.8).

It is meaningless to determine a "most severe landing stop" case for the sole purpose of brake system certification, without considering the global issue of return to land capability that will take into account such other parameters as controllability, other retardation means, landing distances and operational procedures.

We therefore suggest withdrawal of the MSL concept, by modifying the proposed paragraph (f) in $25.735 as follows:

- Replace the first sentence by: "Kinetic energy absorption requirements of each wheel and brake assembly must be determined for the design landing stop and the maximum kinetic energy accelerate-stop."
- Delete the sentence: "The most severe landing stop need not be considered for extremely improbable failure conditions or if the maximum kinetic energy accelerate-stop energy is more severe."
- Replace the last sentence by: "In addition to the design landing stop and maximum kinetic energy accelerate-stop, the brake energies associated with foreseeable cases of immediate return to land must also be considered. For these cases, operational procedures, possible fuel jettisoning for a maximum of 15 minutes, use of retardation means, and landing distances must be taken into account."

As a result of this proposal, any reference to the most severe landing stop should be removed from AC 25.735-1X, paragraph 4.f.

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