

Docket No. SA-522

Exhibit No. 2-W

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C.

Airbus Correspondence to the NTSB
Regarding Aircraft Performance Draft Report of
American Airlines Flight 903

(4 Pages)





P5, 8

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DATE : June 10, 1998
OUR REF. : 446.0076/98
FROM : AI/EE-Q Dominique BUISSON

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Total number of pages including transmittal letter : 11


Subject: AAL Flight 903 : Comments on the draft report from the ACPG

Dear John,

Please find attached note AI/EE-Q n° 446.0074/98, gathering our comments on your draft report.

We repeat again that you made a wonderful work with this report, and our comments, intended to be detailed, only suggest some minor corrections.

With my best regards.


Dominique BUISSON

2

Comment n° 11:

§ D "DETAILS OF THE INVESTIGATION", page 18, 1st bullet:
- same comment than comment n° 10.

Comment n° 12:

§ D "DETAILS OF THE INVESTIGATION", page 18, 1st bullet:
One could be surprised when reading this paragraph that Stall warning and actual stall are so close. In fact, several things can explain that:

- . the delay between the stall warning recording on the DFDR and the actual stick shaker activation (which is the first event to be triggered on the airplane when the logic condition "stall warning" is computed).
- . the fact that, as roll spoilers are extended, stall happens earlier (refer to our computation of CL, sent through note n° 446.0103/97, dated July 25, 1997, in particular figure 2C).
- . the fact, that due to the pitch and the roll rates which are present, the right hand wing stalls earlier than seen by the AoA vane.
- . the Mach number effect, which makes the wing stall earlier, whereas the stall warning is independant of Mn.

Comment n° 13:

§ D "DETAILS OF THE INVESTIGATION", page 19, 1st bullet:
- it is said "This coordinated use of almost full roll and yaw control authority resulted in extreme bank angles, including..."
- the primary effect is to create **extreme roll rates**, before creating extreme bank angles. By the way, the word extreme seems appropriate to qualify what has been obtained on the subject aircraft (ie very much outside of any operational manoeuvres) and it is these extreme roll rates that led to SGU resets and PFD images disappearing and showing diagonales for a short time. We would like to remind that we based our reasoning for the "roll rate" value (in fact a difference between the SGU input and the SGU displayed value) for implementing the SGU auto monitoring function on such extreme roll rates and, unfortunately, we did not consider the kind of extreme rudder inputs that were applied by the pilot this day (after having followed the AAL AAMP* training recommending to use such rudder inputs). We remind as well that the SGU reset occured during the second oscillation (the first one, which can be considered already as extreme, did not lead to a SGU reset...)
- then we would propose to say: "This resulted in **extreme roll rates and then extreme bank angles....**"

3

Comment n° 20:

§ E "CONCLUSIONS", page 33, 3rd bullet:

In addition, icing should not be either the explanation. See our comment n° 16.

Comment n° 21:

§ E "CONCLUSIONS", page 33, before-last bullet:

It is not clear in your before-last paragraph in this page if you actually propose a test flight on the "accident" aircraft. It should be made clear that the ACPG (it is at least the belief of AIRBUS INDUSTRIE) do not expect a test flight on the subject aircraft, as proposed in this paragraph, to be of a significant benefit for the inquiry. We would recommend to reword the sentence, as proposed later.

At this point, it is perhaps also useful to remind, and this has been already stated several times, that we know that the A300 is "heavy" in terms of roll behaviour at stall or just before stall, and that this may need large roll inputs in order to keep the aircraft inside the certification limits.

Note: In case such a flight test is finally deemed necessary, we would like to insist that it is done in the frame of the ACPG, which duty is to establish facts, and we think that this is fully appropriate to conduct such tests with an AIRBUS INDUSTRIE test pilot as this is done for every certification flight.

However, we agree with your following paragraph and we would rather recommend to concentrate on the fact that no action was taken by the crew to avoid entering such a flight regime and try to explain it for avoiding such events to happen again. Also, it could be interesting to concentrate on the way to better train pilots for recovering from stalls that may still happen on every "non-protected" airplane, on the contrary to the AIRBUS INDUSTRIE generation of protected airplanes like the A320/A321/A319 family or the A330/A340 family.

For this last issue, we are happy to say to the NTSB that AIRBUS INDUSTRIE has participated to the "upset recovery training" establishment with other American aircraft manufacturers and that this new training will be fully in line with your last paragraph in page 34.