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May 23, 1995
B-U01B-15262-ASI

Mr. Thomas Haueter, AS-10
National Transportation Safety Board
490 L'Enfant Plaza SW
Washington, D.C. 20594

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Subject: USAir 737-300 N513AU Accident Near Pittsburgh - September 8, 1994

Reference:
(a) NTSB letter J. Hall to J. Purvis (undated)
(b) Boeing letter B-U01B-15085-ASI dated January 12, 1995
(c) Boeing letter B-U01B-15011-ASI (with enclosure) dated November 17, 1994

Dear Mr. Haueter:

The reference (a) letter included an action item list prepared after the USAir Flight 427 Public Hearing. Item 19 of the list concerned adding information about the March 8, 1994 Sahara India Airlines 737-200 training accident at New Delhi to the USAir accident public docket. This letter provides information Boeing feels should be included, if any information concerning the Sahara accident is included in the public docket.

We understand that the NTSB currently intends to include information concerning the main rudder Power Control Unit (PCU) in the docket. We believe reference (b) and (c), which relate to the PCU, should be included. These letters are already in the NTSB's possession. In order to avoid misunderstanding as to the significance of the information pertaining to the PCU, however, we believe a broader collection of information should also be included in the docket.

As you may know, the final report on the Sahara India accident has not yet been released by the Indian government. However, a Public Hearing was conducted in November 1994 to investigate the accident. A summary of what was discovered during the hearing, which is described in detail in the enclosures, is included in this letter. Therefore, along with including reference (b) and (c), we request that the NTSB include this letter and its enclosures in the USAir public docket. When it is completed, we suggest the Indian Government report on the Sahara accident also be included in the docket.

Summary:

On March 8, 1994, Sahara India conducted its first in-flight training session for pilots seeking to become first officers on the 737. The three Sahara trainee pilots had completed their 737 simulator training and the accident flight was the first occasion in which these trainees would actually fly the 737. The instructor pilot in command of the flight had received his approval to act as an instructor pilot on March 8, 1994, the same day as the accident. It was his first flight as a 737 instructor pilot. Thus, the accident flight involved the first ever training flight conducted by Sahara India; the instructor pilot's first ever flight as a 737 flight instructor; and the first ever 737 flight of any kind flown by the three trainee pilots.

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The flight was to consist of three takeoffs and landings for each trainee pilot. Sahara India representatives testified at the Public Hearing that the training session was not intended to involve any abnormal or emergency procedures. The weather was good and there were no significant open maintenance items when the airplane was released for the flight.

According to training records, the student who was flying at the time of the accident had difficulty in the 737 simulator scanning the instruments, using the rudder, trimming and keeping the aircraft straight (Enclosure A). On February 11, 1994, less than one month before the accident, the student pilot's simulator instructor noted that the student hesitated in trimming with the rudder during single-engine simulator flying. The simulator instructor noted in his records that the student "gets panicky on single engine." At the Public Hearing, the simulator instructor testified that the student lost his orientation and failed to scan the instruments during his simulator engine inoperative training (Enclosure B). The student's total flying experience was 330 hours, the majority of which was in single engine light aircraft.

The accident sequence took place during the student's third and final touch-and-go circuit. According to the cockpit voice recording, the student rotated the aircraft for its final takeoff at Flight Data Recording (FDR) time of 2904. Three seconds later, at FDR time 2907, the instructor announced that "nothing is happening," followed at FDR time 2909 by "let's see what to do now" (Enclosure C).

At the same time the instructor said "Let's see what to do now," the left (No. 1) Engine Pressure Ratio (EPR) began to decline. The decline in EPR continued for five seconds, from FDR time 2909 to 2914. During this five-second interval, the aircraft developed a positive rate of climb, and at FDR time 2914, the instructor announced that he was putting the "Gear up."

As the instructor was seated in the left seat of the flight deck, he would have been slowly retarding the left engine thrust lever with his right hand from FDR time 2909 to 2914. He would have to move his hand at about FDR time 2914 to raise the landing gear handle. This act, of moving his right hand off the

thrust lever and to the landing gear handle, is consistent with the relatively constant left engine EPR from FDR time 2914 to 2917. Once the landing gear handle was raised, it appears the instructor returned his right hand to the left engine thrust lever and continued from FDR time 2918 to 1921 to retard the thrust lever to the "IDLE" position.

At FDR time 2921, the unsafe landing configuration horn sounded. This alarm is designed to sound when any one of the three landing gears is not down and locked, and for the flap 15 degree position, if either thrust lever is retarded to the "IDLE" position. The sounding of the unsafe landing configuration horn, EPR behavior and lack of any physical evidence of an engine failure, confirm that the instructor pilot was intentionally simulating an engine failure.

The best simulation match obtained for this accident (simulation run number 13) suggests that the student initially compensated for the thrust asymmetry by using right control wheel until FDR time 2923. At FDR time 2923, the instructor called "rudder, rudder, rudder." At that point, the best simulator match obtained indicates the rudder moved about 12 degrees to the left for approximately two seconds with full right control wheel. The aircraft rolled severely to the left, reaching an extreme of over 100 degrees left wing down at FDR time 2928. The instructor pilot shouted "Leave, leave," and apparently took control of the aircraft, applying right rudder and full right control wheel. These inputs momentarily began to correct the left roll. About three to four seconds before impact, the left thrust lever was advanced and the left EPR increased (Enclosures D & E).

The student's simulator instructor, an experienced in-flight instructor, testified at the Public Hearing upon reviewing the accident CVR that the student appeared excited on his first flight and his performance during the accident sequence was "below my [the simulator instructor's] expectation." This would be consistent with the manner in which the student responded to the simulator training on one engine, less than one month before the accident.

Preliminary findings made by the Indian DGCA are contained in Enclosure A. Finding 28 states "From the evidence available so far, it appears this was a case of simulated one engine inoperative training exercise at a low height in which the aircraft turned to left, lost height and impacted the ground. Aircraft handling by the crew during this exercise needs further examination. Refinement of UFDR data may help in the investigation of this aspect." The combined evidence strongly suggests that the student's confused response to a stressful and unplanned engine-out training procedure resulted in loss of control from which the instructor pilot was unable to recover and prevent the accident.

If The Boeing Company can be of further service, please do not hesitate to call.

Very truly yours,

FLIGHT TEST

[redacted]

FOR

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[redacted]

Enclosures:

A. Report on Accident to Sahara India Airline's B-737 aircraft VT-SIA During Training Flight at IGI Airport, Delhi, on 8 March 1994, by V.K. Chandna, Inspector of Accident.
B. November 17, 1994 Public Hearing testimony of Captain R.N. Rao, Operations Manager for Indian Airlines and simulator instructor of trainee pilot Vidul Mahajan.
C. Correspondence of November 2, 1994 from John W. Purvis, Boeing Commercial Airplane Group, to J.S. Wazir, Secretary of Court of Inquiry, Office of DGCA.
D. Flight data recording for accident sequence, annotated with comments from cockpit voice recording.
E. October 27, 1994 simulator match of flight recorder data (Run 13).

cc/with encls: Al Dickinson - NTSB