

SAFETY – 737 United 585 - POSTSCRIPT

As we reflect on the ten year history of the United 585 investigation we remember our loved ones who died on two major 737 disasters: 25 souls on board United 585, March 3, 1991, and 132 souls on board US Airways 427, September 8, 1994. We honor them with our commitment to promote the highest standards of aviation safety for our family, friends and the traveling public.

On June 5, 2001, the NTSB released a Revised Final Report for United 585, the Boeing 737, which crashed on March 3, 1991, at Colorado Springs, CO. The first "final report" was dated December 8, 1992.

On March 24, 1999 the NTSB formally revised the Probable Cause for UA585 to be:
"A loss of control of the airplane resulting from the movement of the rudder surface to its blowdown limit. The rudder surface most likely deflected in a direction opposite to that commanded by the pilots as a result of a jam of the main rudder power control unit servo valve secondary slide to the servo valve housing offset from its neutral position and overtravel of the primary slide."

United 585 was possibly the first major commercial airline crash with no Public Hearing back in 1992. A meeting was held which tended to blame the wind for the crash. UA585 is now one of the few major commercial airline crashes with a Revised Final Report.

We very much thank Jim Hall, NTSB Chair at that time, and the NTSB investigators for their diligence, years of investigation, and for the extensive revisions to the report.

On March 24, 1999, at the USAir 427 Final Public Hearing the NTSB issued a Probable Cause for US427 and UA585 as a rudder reversal, however, it took two years to have these comments incorporated into the Revised Final Report for UA585.

For years the industry blamed UA585 on the wind, although Chairman Jim Hall stated March 24, 1999 that the NTSB knew UA585 was not brought down by the wind because there was no change in the altitude or speed recorded on the flight data recorder. Chairman Hall stated that it would have taken a wind rotor at least 36 times greater force than the strongest wind rotor ever documented in Colorado Springs to possibly disrupt a 737.

Some of the information added to the United 585 Revised Final Report was known in 1991-1992, and some reflects more recent research. The Revised Final Report includes important key points about the Boeing 737, and the probable cause of UA585, such as the following. Note the vertical lines in the margin of the Revised report which is information added after the December 8, 1992 report.

- The 737 is the only commercial jet aircraft in the U.S. with one power control unit (PCU) system and a single rudder panel. Other commercial aircraft have two or more power control systems, (which provide a backup system). (Page 13).
- There are many statements such as the following (page 60) which make it clear that wind did not bring down the 737. ***"Thus, the simulations showed that wind excursions alone did not result in the United flight 585 upset and loss of control."***
- The report includes important information, which was excluded from the first final report about the "Mack Moore" United 737 incident of July, 1992. It was a significant event because the tests proved that there was a potential for a rudder reversal on all 737's, and many people involved in those tests became aware of the fatal flaw. (Page 69-70)
- We now know that on March 18, 1999, Parker Hannifin, manufacturer of the 737 servo valve, advised the NTSB of engineering documents from 1966 which revealed important servo valve modifications to the prototypes, which would "not cause reverse flow."
(This demonstrates that the manufacturer was studying the rudder reversal in 1966!) (Page 21)
- The Revised Final Report lists five "Other Documented Rudder Control Incidents" (Page 68). The footnote refers to additional rudder incidents reported in the USAir 427 report (USAir 427 - AAR-99/01 DCA94MA076 Pages 148-152).

- The USAir 427 report lists 8 (eight) 737 Potential Rudder System Events. Also, January 1999, Parker Hannifin notified the NTSB that a recent search produced three additional rudder reports from 1982 through 1984!

- There are also references to other fatal aviation accidents that involved flight control reversals on Page 79 of the UA585 Revised Final Report.

- The Revised Final Report Findings continues to call for the FAA to mandate upgraded Flight Data Recorders. (Page 114) (The Black Box is the most important tool in air crash investigation, yet state-of-the-art Flight Data Recorders are more often found on European airplanes. Boeing needs to install the best CVR and FDR as standard equipment in new planes, and the FAA needs to mandate this known technology on passenger planes within the next 12 months).

- The UA585 aircraft had rudder control problems six days before the accident flight and four days before the fatal crash. (Page 120)

A copy of the 214-page United 585 Revised Final Report may be viewed at the NTSB website: www.nts.gov Go to "Publications," (left column) Click on "Aviation, Older Accidents," and UA585 is the second report listed. Click on PDF format for a complete report in Adobe format. Check with the NTSB to order a printed copy by mail: 202-314-6000.

Title: Aircraft Accident Report: Uncontrolled Descent and Collision with Terrain, United Airlines Flight 585, Boeing 737-200, N999UA, 4 Miles South of Colorado Springs Municipal Airport Colorado Springs, Colorado March 3, 1991

NTSB Report Number: AAR-01-01, adopted on 3/27/2001 [[Summary](#) | [PDF Document](#)]

NTIS Report Number: PB2001-910401

<http://www.nts.gov/publictn/2001/AAR0101.pdf>

The Revised Final Report for UA585 reports three air crashes as unsolved, in the 34-year history of the NTSB. The three are:

- January 6, 1969, a Convair 440 in Bradford, PA that killed 11
- November 14, 1970 crash of a DC-9 in Huntington WV that took 75 souls, including the Marshall University football team
- March 13, 1974 crash of a Convair 340/440 in Bishop CA that took 36 lives, including a film crew.

The *NATIONAL AIR DISASTER ALLIANCE / FOUNDATION* will continue to support all those impacted by these devastating air disasters, in their search for the truth, via support for prompt disclosure of air crash investigation information, support for True Public Hearings, release of air crash information during the investigation, and compliance with the Freedom of Information laws. The NTSB conducts air crash investigations, however, the airline industry is often 90% of the team, and so too often the industry is investigating themselves. The NATIONAL AIR DISASTER ALLIANCE supports the need for Independent Oversight of air crash investigations so the traveling public is promptly represented in this process.

For me personally this has been an emotional ordeal for over ten years. In 1991 we were denied a Public Hearing, and considerable information was withheld from the family members and the public in general. I was told privately that the cause of UA585 was the rudder failure, yet the industry went to extensive means to blame the wind and anything but the True Probable Cause. Some of the disclosures represent data through improved technology, however the Revised Final Report also includes information that should have been public long ago. It appears that improvements have been made to the 737 rudder design, however, it is long overdue to re-design the next generation of Boeing aircraft with two or more power control units, to have a true back-up system on the aircraft, similar to other commercial aircraft. Our loved ones are worth it, and so are yours!

Gail Dunham

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