NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC
April 22, 2003

Emery Flight 017 Airplane Performance Study
Addendum 2

Dennis Crider

A. ACCIDENT

Location:	Rancho Cordova, California
Date:	February 16, 2000
Time:	1951 Local Time
Aircraft:	Douglas DC-8-71, N8079 U
Operator:	Emery Worldwide Airlines, A CNF Company (FAR Part 121 Supplemental)
NTSB#:	DCA-00-MA-026

B. GROUP

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C. SUMMARY

On February 16, 2000, at 1951 Pacific standard time, a Douglas DC-8-71F, N8079U, registered to and operated by Emery Worldwide Airlines as flight 17 for the 14 CFR Part 121 scheduled cargo service from Sacramento, California, to Dayton, Ohio, crashed shortly after takeoff from Mather Field, Rancho Cordova, California. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed. The airplane was destroyed by impact forces and a post-crash fire. The three flight crew members were fatally injured.

D. DETAILS OF INVESTIGATION

Purpose of Addendum

The original report derived the control tabs during a control anomaly 8 1/3 minutes before the landing at Mather field before the accident takeoff. With the 11-degree elevator offset derived from the recorded elevator with the gust lock on, the recorded elevator was between 4 ½ and 5 deg trailing edge down before the control anomaly. The DC-8 Flying qualities report shows elevators generally between 1 ½ and 2 ½ degree trailing edge down for trimmed flight. The Kinsurf program was run iterating on column offset and elevator offset to find the trim condition during the period before the control anomaly. That is, the offset to the elevator trace was found that produced zero column force while the offset to the column trace was used to make sure that the control tab obtained from mechanical gearing and linkage (modeled with the left tab) matched the control tab required to get the elevator deflection (modeled with the right tab). Kinsurf calculated a stabilizer for each offset elevator trace. The Zero column Force, aircraft equilibrium trim condition was satisfied with a 3.2 deg additional trailing edge up offset to the original 11 deg offset from the FDR elevator (14.2 degrees trailing edge up offset from the FDR). No offset was required to the column[1]. The 14.2 degree elevator offset also brought the elevator into the range shown in the DC-8 Flying Qualities report for trimmed flight.

The original report used an elevator with the 11 degree elevator offset derived from the recorded elevator with the gust lock on applied to derive the control tabs for the accident flight. Kinsurf was run again for the accident flight using the 14.2 trailing edge up offset to the FDR data. The results are shown in figure 1.

[1] The column was, however, adjusted from the vertical reference zero of the FDR to the design zero 13.5 degrees forward of the vertical column position. The design zero column corresponds to zero control tab deflection when the elevator is zero.

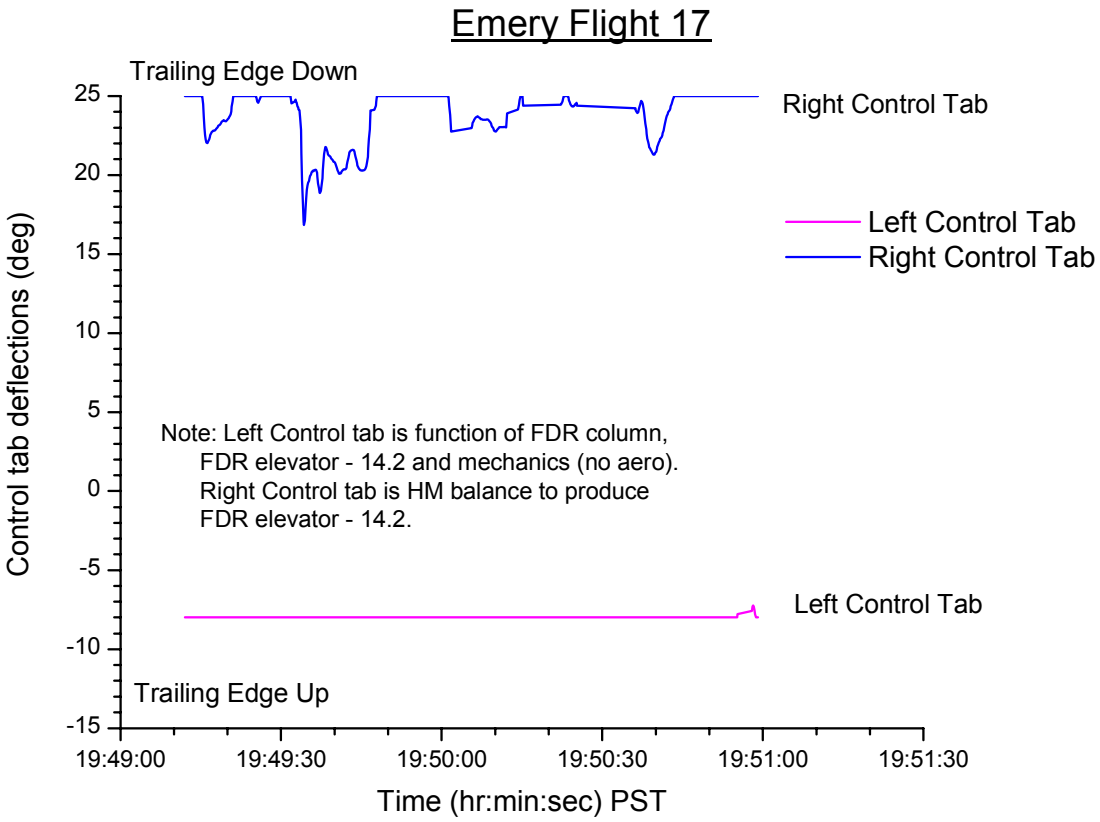

Figure 1: Derived control tabs for the accident flight

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