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P.O. Box 3707
Seattle, WA 98124-2207

August 23, 1995
BXK01-15345-ASI

Tom Jacky, RE-60
NTSB
490 L'Enfant Plaza SW
Washington DC 20594

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

BOEING

Dear Mr. Jacky:

During the field investigation of the subject accident, an observer on the ground reported seeing smoke coming from the airplane at the time of the event. Analysis indicates that the combined effects of the atmospheric conditions and the low pressure field created on the upper surface of the wing was sufficient for the formation of a vapor trail.

The flight data recorder showed that at the time of the accident, the airplane was traveling at 190 kts. at an altitude of 6000 ft. with flaps 1 (Figure 1). During the event (at time 139.7 sec.) the airplane experienced load factor of 1.6 at 194 kts. resulting in an airplane C_L=1.4. Flight pressure data and CFD analyses at an airplane C_L=1.32 (α =10.7 deg. Figure 2) show an average pressure coefficient (C_P) of about -1.2 (1543.4 psf) from 0 to 50% chord on the upper surface of the outboard wing. This drop in pressure would result in a 44.6° F drop in temperature. The atmospheric conditions on the day of the incident (Figure 3) indicate that the dew-point temperature was within 5° C (9 F) of the ambient temperature at 6000 ft. creating ideal conditions for the formation of a vapor or condensation trail.

In summary, based on the pressure on the outboard wing and the close proximity of the dew point, it is likely that a vapor trail could have been created by the wing at or near time 139.7 from Figure 1.

[redacted]

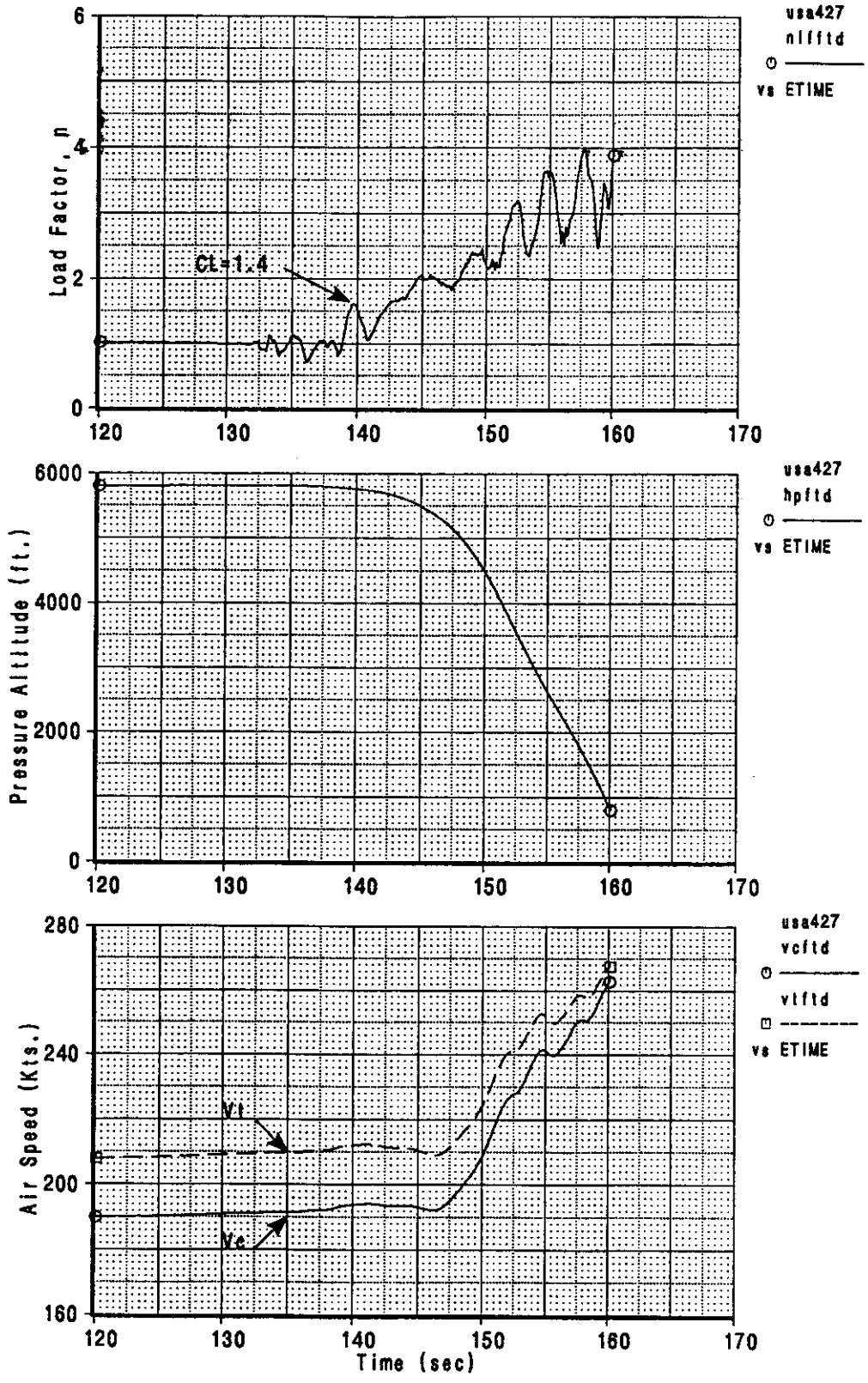
J.W. Purvis
Director, Air Safety Investigation
BXK01, M/S 14-HM

[redacted]

Enclosures: 3 as noted

cc: Tom Haueter, AS-10

USAIR Flight #427



[A]: /acct/whh4297/usa/usa427_04may95_thin.pro Wed Jul 12 1995 13:51:50

CALC	Howard	12Jul95	REVISED	DATE	USAIR Flight #427 Parameters from Flight Data Recorder	
CHECK						FIGURE 1
APPD.						
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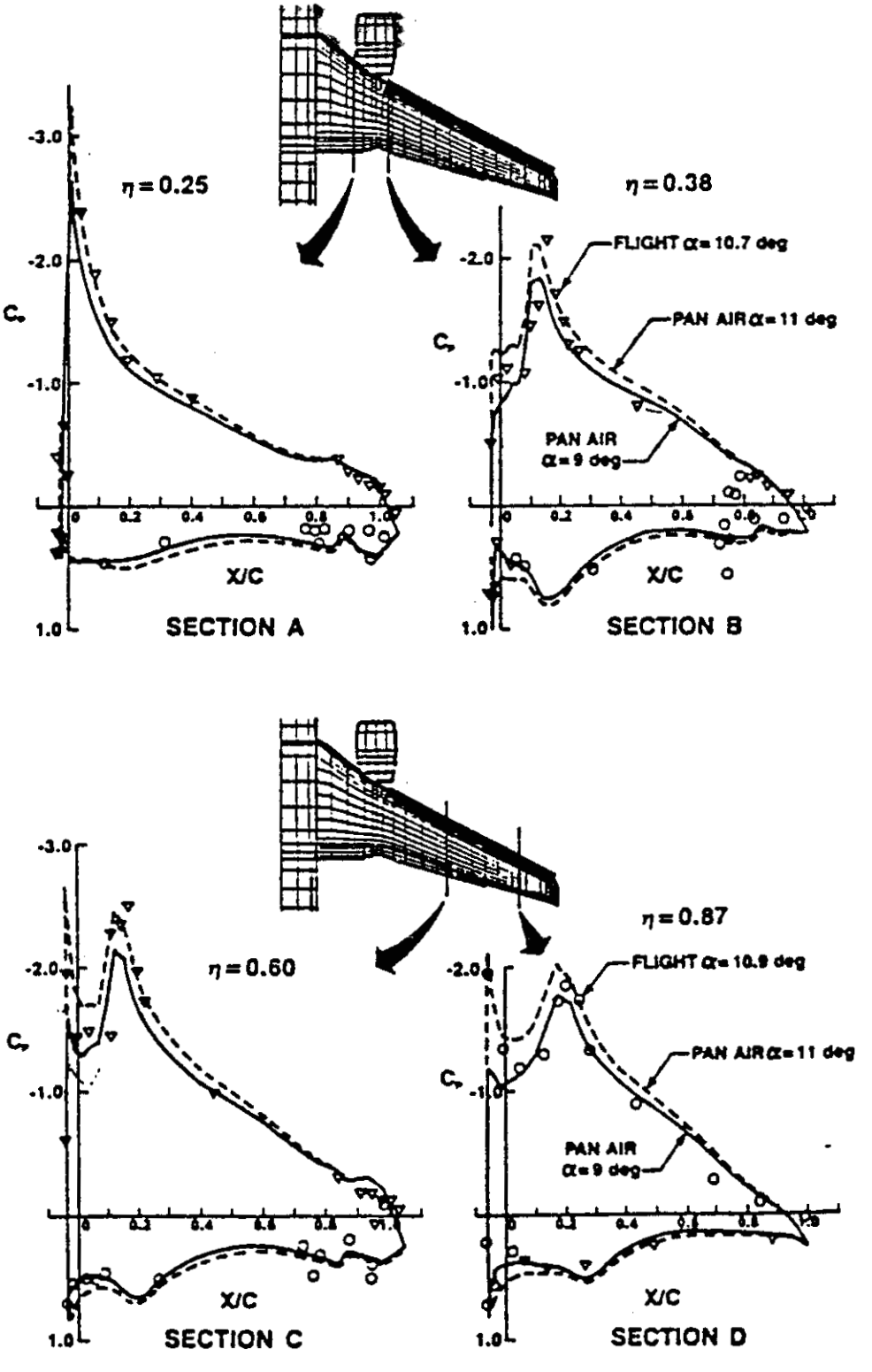

Figure 15. Flaps 1 - Wing Pressure Distribution

2

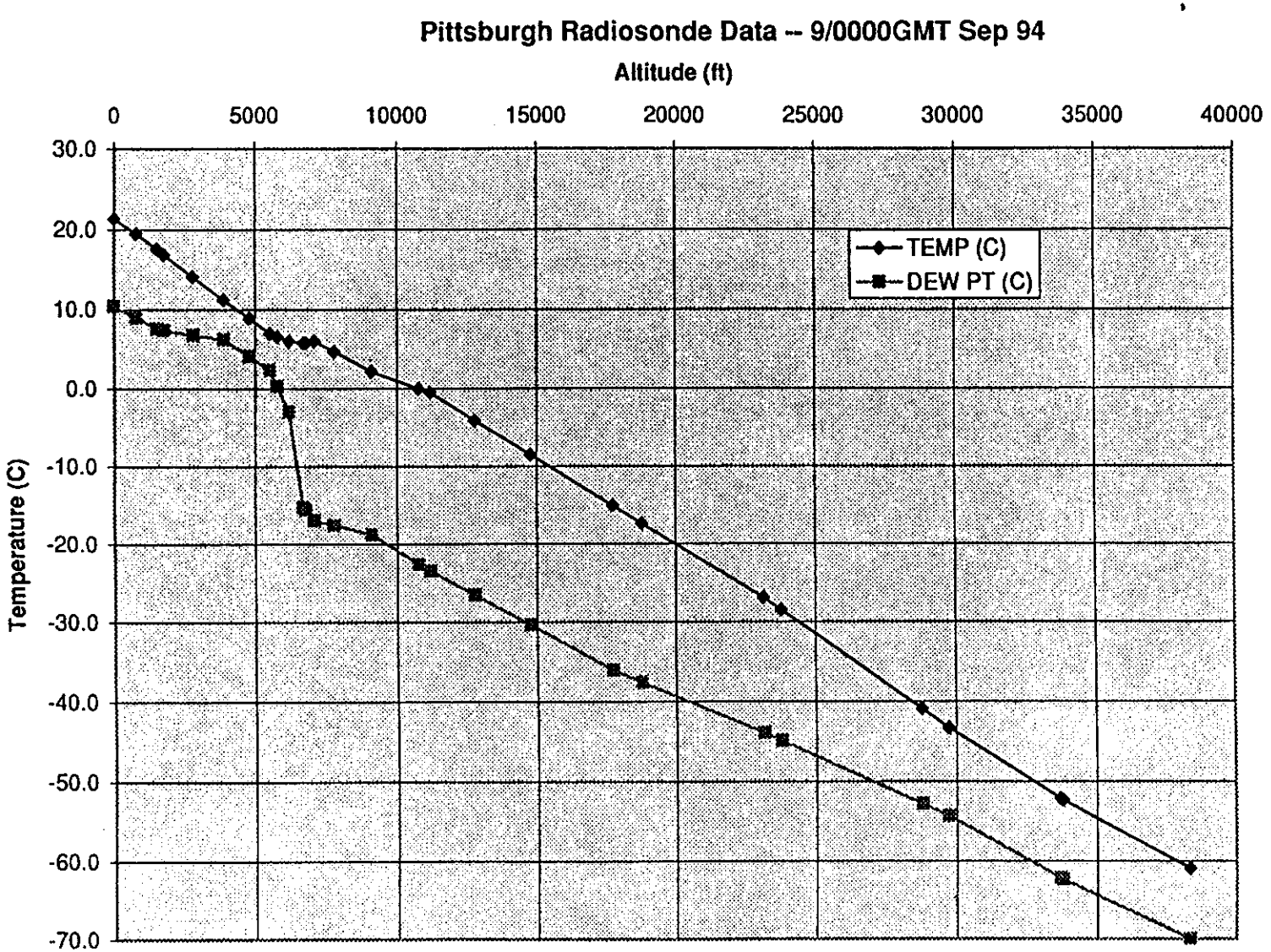
Pittsburgh Radiosonde Data -- 9/0000GMT Sep 94
Altitude (ft)
0
5000
10000
15000
20000
25000
30000
35000
40000
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Temperature (C)
TEMP (C)
DEW PT (C)

Figure 3