ATTACHMENT 5

Reprint from an American accident report concerning speech analysis in the investigation of a 1995 general aviation accident
(4 pages)

National Transportation Safety Board
Office of Aviation Safety
Washington, D.C.

July 3, 1996

Factual Addendum

A. ACCIDENT: SEA95FA175
LOCATION: Swan Lake, Montana
DATE: August 7, 1995
AIRCRAFT: Beech F33A, N8014R

B. INVESTIGATOR

Malcolm Brenner, Ph.D.
National Transportation Safety Board
Washington, DC 20594
[redacted]

C. DETAILS OF THE INVESTIGATION

Additional information was developed concerning this accident, as follows:

1. Spectrogram of the final statement

The NTSB Audio Laboratory prepared a spectrogram of the final statement by the pilot recorded at 2132:30 on the air-to-ground recording by the FAA En Route Flight Advisory Service. The spectrogram provides a visual presentation of the audio energy and timing of this statement. It is included as Attachment 1.

As noted in the spectrogram, the pilot had four audible breath sounds associated with his statement, as follows:

"Ah roger that ah [breath] understand [breath][breath][breath]"

As shown in the spectrogram, the final three breath sounds covered a time period of about 2.5 seconds. During this time, the pilot did not speak but his microphone was keyed. There were no audible breath sounds in the pilot's previous communications recorded at 1530:53, 1531:01, and 1531:40.

2. Review by AFIP personnel

William Gormley, M.D., and Steven Cogswell, M.D., of the

Armed Forces Institute of Pathology (AFIP), reviewed the autopsy report, the audio tape, the radar data, and the narrative factual report from this accident. As shown in Attachment 2, they concluded that incapacitation of the pilot, probably due to his severe atherosclerotic coronary artery disease, was a causal factor in this accident.

Contacted by telephone, Dr. Cogswell cited several factors considered in reaching this conclusion:

The abrupt change in aircraft attitude from a gradual climb to a steep dive;

The abrupt change in the pilot's speech from normal communication to absence of communication;

The pilot's medical history of severe coronary disease, and absence of medical history for other incapacitating conditions such as seizure;

The evidence of difficulty in breathing displayed in the last audio statement.

3. Review by speech expert

Dr. Alfred Belan, M.D., of the Interstate Aviation Committee (IAC), Moscow, Russia, reviewed the audio tape, the radar data, and the narrative factual report from this accident. He is Chief of the Acoustics Laboratory of the IAC and an authority on speech analysis in aircraft accident investigation.

Dr. Belan agreed that the breathing problems shown in the pilot's last statement were consistent with a medical difficulty. His comments are included as Attachment 3.

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

REPLY TO ATTENTION OF

PATIENT IDENTIFICATION		PLEASE USE AFIP ACCESSION NUMBER IN ALL CORRESPONDENCE
AFIP ACCESSION NUMBER 2543335-0	CHECK DIGIT	SEQUENCE 00
NAME GRAHAM, Michael A. A95-21		SSAN
SURGICAL/AUTOPSY PATH ACCESSION #'S		
PLEASE INFORM US OF ANY PATIENT IDENTIFICATION ERRORS		

Mr. Malcolm Brenner
National Transportation Safety Board
800 Independence Avenue, S.W.
Washington, D.C. 20594

WTG/jtl WTG

DATE: **27 June 1996**

CONSULTATION REPORT ON CONTRIBUTOR MATERIAL

AFIP DIAGNOSIS:

1. Multiple blunt force injuries, accident, natural, 37-year-old white male pilot of a Beechcraft Bonanza, F33A, aircraft which suddenly departed its normal flight path and crashed leading to the death of the pilot and his passenger, 7 August 1995, Columbia Falls, MT.

We have reviewed the autopsy report, mishap summary, radar altitude plot, audio tape and transcript of radio transmissions provided by the NTSB. This data, along with the reported absence incapacitation of the pilot, probably due to his severe atherosclerotic coronary artery disease was a causal factor in this accident.

[redacted] WTG

William T. Gormley, M.D.
Col, USAF, MC, SFS
Assistant Armed Forces Medical Examiner

From: Alfred Belan
To: Malcolm Brenner

Opinion about No8014R (after listening to the tape)

1. Pilot started feeling bad in flight
2. Healthy people do not have hypoxi, which could affect their actions, at the altitude below 4,000 meters.
3. Since in this case we are dealing with heart problem, hypoxi could cause the heart attack, or resistance to heart problem decreased due to hypoxi. To find out for sure, we need to know, if pilot was flying at this altitude before, for how long, if he had any heart problems after that, how long was his flight
4. First impression: hypoxi caused the heart attack.

Alfred Belan