



National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

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Date: March 17, 1987

In reply refer to: A-87-11 through -15

Honorable Donald D. Engen
Administrator
Federal Aviation Administration
Washington, D.C. 20591

About 2050 on March 13, 1986, Simmons Airlines flight 1746, an Embraer Bandeirante, EMB-110P1, operating as a regularly scheduled flight, departed the Detroit Metropolitan Airport en route to Sault Ste. Marie, Michigan, with a stop in Alpena, Michigan. The en route portion of the flight to Alpena was uneventful. However, due to the prevailing instrument meteorological conditions, the crew was unable to complete the instrument landing system (ILS) approach and land and they declared a missed approach at 2142. At 2153, the flight was cleared for a second ILS approach to Alpena. At 2156, the crew acknowledged that radar services were being terminated. This was the last transmission from the airplane. About 2215, a motorist reported that the airplane had crashed. The airplane was found in a wooded area about 300 feet to the left of the extended centerline, and 1 1/2 miles short of the threshold of runway 1 at Alpena. The airplane was destroyed and two of the seven passengers and one of the two crewmembers onboard were killed. 1/

The Safety Board concludes that the communication of weather information to the flightcrew of flight 1746 was deficient and that this factor contributed to the accident. Despite the fact that the crew would probably have obtained more current information from either the Simmons station manager or the approach controllers had they asked for such information, they were not required to and did not ask for it. As a result, they were unaware that conditions at Alpena had deteriorated to below minimums for the ILS approach. Had the crew been aware of this, they would have been prohibited by 14 CFR 135.225(b) from commencing the ILS approach to Alpena and the accident probably would have been avoided.

Although the AFOS system for transmitting weather information appears to be unnecessarily complex, the transmissions from Alpena to Wurtsmith Air Force Base, by way of Maryland, Kansas City, Saginaw, and Pellston, were electronic and therefore very rapid, occurring within seconds. Transmission was not slow until information was sent from Pellston to Wurtsmith. Because the Air Force base was not able to access the FAA weather information system electronically, controllers had to talk to personnel at the Pellston FSS, via direct line, and ask them for the weather. Personnel at Pellston then

1/ For more detailed information, read "Aircraft Accident Report—"Simmons Airlines, Flight 1746, Embraer Bandeirante EMB-110P1, N1356P, Near Alpena, Michigan, March 12, 1986" (NTSB/AAR-87-02).

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had to access the information electronically, after completing the duties they were carrying out at the time, and then orally communicate that data to Wurtsmith. The Safety Board believes that this system is quite slow and unnecessarily cumbersome, and that these deficiencies could be rectified easily by providing Wurtsmith with the same capabilities to access the information as FAA facilities have. The Safety Board is aware that this slow process exists in other locations. Consequently, the Safety Board believes that the FAA should provide military ATC facilities that control civilian air traffic with the equipment necessary to allow them to access weather information as quickly as FAA facilities can.

One passenger was killed from impact forces when she was thrown from her seat. A toxicological analysis of this passenger revealed blood and urine alcohol levels indicating that she was intoxicated. Because the accident occurred almost 1 1/2 hours after the airplane left the gate in Detroit, which provided time to metabolize the alcohol, and because no alcohol was served onboard the airplane, and there were no reports that she had consumed alcohol onboard, the Safety Board concludes that she was highly intoxicated at the time she boarded the airplane.

The Safety Board believes that intoxicated passengers can be hazardous to themselves and to other passengers as well. In an emergency where there is a need for passengers to exit the airplane quickly, such a passenger can hamper a rapid evacuation. They can also become unruly and interfere with the duties of flightcrew members, thereby creating an emergency situation. Moreover, when flight attendants are not on board to monitor such passengers inflight, there is a greater need to prevent intoxicated passengers from boarding the flight. It could not be determined whether this passenger had been wearing her seatbelt or, if worn, the extent to which it had been tightened. Since it could not be determined if she had her seatbelt fastened, it is not known whether she would have survived had she followed the instructions of the crew to fasten seatbelts. Without a flight attendant on board, crewmembers could not determine whether passengers had complied with the fasten seatbelt instructions.

Operators are prohibited by 14 CFR 135.121(c) from boarding intoxicated passengers, and the Board believes that carriers operating aircraft under 14 CFR Part 135, without flight attendants onboard, should enhance their passenger screening. The Board concludes that the FAA should issue an operations bulletin to Principal Operations Inspectors of carriers operating under 14 CFR Part 135 informing them of the need to improve passenger screening to prevent intoxicated passengers from boarding aircraft.

Some survivors stated that they saw bright lights on the ground during the first approach. Consequently, the Safety Board assessed the likelihood that the crew may have seen ground lights while executing the second ILS approach, mistaken them for the runway or approach lights, and then continued descending until impact while looking outside the cockpit attempting to see the runway. However, the lights that the survivors described were characteristic of nonairport, residential lights. Certainly, they were substantially different from the approach light system or the runway edge lights that were present at the Phelps-Collins airport. Therefore, it is unlikely that the crew of flight 1746 mistook the ground lights that the survivors described for those at the airport. Moreover, had the approach been executed properly, the airplane would have been too high for the crew to have seen potentially confusing ground lights, in the visibility that existed at the time. Therefore, the Safety Board concludes that the flightcrew did not continue to descend below decision height because they confused ground-based lights with the airport environment.

The Safety Board could not determine if the captain was impaired by alcohol at the time of the accident. Although Simmons colleagues stated that he had consumed 8 to 10 beers the night before the accident, the precise quantity of alcohol consumed could not be established. The individuals who saw and talked to the captain prior to the departure of flight 1746 stated that he appeared normal at that time. In addition, he effectively served as pilot-in-command, in instrument meteorological conditions in several flights just before the accident. This included a missed approach that he executed in Alpena that, according to witnesses, was in a flightpath just above the runway. This indicates a level of precision flying uncharacteristic of a pilot who was impaired due to alcohol consumption. Further, the approximate 20-hour interval between the time the captain had reportedly last consumed alcohol and the time of the accident was sufficient for his body to metabolize the alcohol that witnesses described him consuming. Therefore, at the time of the accident, there should have been no alcohol present in his system.

Nevertheless, the captain could, without the presence of alcohol in his system, still have experienced "hangover effects" from the alcohol consumed the night before the accident. Recent studies 2/ have suggested that even without measurable levels of alcohol in the body, pilots still showed decrements in performance 14 hours after consuming alcohol. Other studies, 3/, 4/ conducted in laboratory and in simulated high altitude settings, indicated that pilot performance was not significantly impaired 8 hours after alcohol consumption. This apparent contradiction in results could be due to the differences in the methodology among the studies. That is, the studies employed different independent variables to quantify differences in alcohol consumption, and used different dependent variables to measure differences in pilot performance.

The Safety Board is troubled by the inconsistency in the research findings as they apply to alcohol consumption by pilots. Since a large body of literature indicates that alcohol can degrade performance even after the body has metabolized it, the Safety Board believes that the FAA should determine whether 14 CFR 91.11, which prohibits pilots from performing as crewmembers within 8 hours of consuming alcohol, is still supported by current research. Therefore, the Safety Board believes that the FAA should reexamine this rule, in the light of the recent findings, and carry out the research needed to establish the minimum amount of time, following alcohol consumption, required by pilots to perform their duties without impairment.

The evidence suggests that the captain was not impaired by alcohol at the time of the accident. At the same time, the Safety Board believes that the captain's behavior was suggestive of an individual who, at best, exercised poor judgment about consuming alcohol in proximity to performing his duties as a pilot-in-command of scheduled revenue passenger flights and at worst, had not acknowledged an alcohol consumption problem, thereby jeopardizing the lives of those who flew with him. That a previous employer had terminated the captain's employment may have alerted the captain to potential alcohol related problems and, according to records at Simmons, he did improve his performance. Nevertheless, Simmons did not check his previous work history and had no program to deal with pilots with alcohol related problems. The Safety Board was pleased to learn that Simmons, following revisions to 14 CFR 121, has instituted a program to check the

2/ Yesavage, J.A. and Leirer, V.O. Alcohol hangover in aircraft pilots: A preliminary report of effects 14 hours after ingestion. Unpublished Manuscript, 1985.

3/ Collins, W.E. and Chiles, W.D. Laboratory performance during acute intoxication and hangover. FAA Report (FAA-AM-79-7). October, 1978.

4/ Collins, W.E. Performance effects of alcohol intoxication and hangover at ground level and at simulated altitude. FAA Report (FAA-AM-79-26), October 1979.

previous employment records of pilots upon their application for employment. However, individuals can conceal alcohol abuse and still perform as pilots. Therefore, the Safety Board believes that without a rehabilitation program for pilots with alcohol related problems, pilots will not be encouraged to seek treatment, thereby increasing the risks to themselves and their passengers. The Safety Board believes that the FAA should encourage all carriers operating revenue passenger flights to institute rehabilitation programs for pilots with alcohol and substance abuse problems.

On May 4, 1984, the Safety Board issued its Safety Study: "Statistical Review of Alcohol-Involved Aviation Accidents, 1975-1981" (NTSB/SS/84-03). As a result of the Study, the Safety Board has issued the following recommendation (A-84-49) to the FAA:

Seek legislative authority to use the NDR to identify airmen whose driving licenses have been suspended or revoked for alcohol-related offenses.

The FAA has responded that it could not use evidence from the National Driver Register (NDR), by itself, to determine fitness for medical certification. As a result, the Safety Board has classified that recommendation "Closed—Unacceptable Action." Since the Safety Board obtained information on the captain's use of alcohol following a search of his driving license history in the NDR, the Board believes that the NDR can be one source of information, to be used with others, to assist in the identification of pilots with alcohol-related problems. Therefore, the Board reissues Recommendation A-84-49 and urges the FAA to comply and seek the requisite legislative authority.

As a result of its investigation of an accident at Felt, Oklahoma, on October 1, 1981, ^{5/} the Safety Board issued four recommendations to the FAA requiring the installation and use of cockpit voice recorders and flight data recorders, as soon as they are available, on all multiengine, turbine-powered, fixed-wing, or rotor type aircraft that are certificated to carry six or more passengers, and requiring that the flight data recorders store significant parameters of aircraft performance. Although the Safety Board is encouraged by the FAA's notice of proposed rule making (NPRM) issued on January 8, 1985, concerning CVRs on newly manufactured multi-engine, turbine-powered, fixed-wing aircraft operating under 14 CFR 135, it is concerned that a final rule has yet to be issued. Therefore, the Board urges the FAA to expedite implementation of the rule. Further, the Board believes that the issues of flight parameters and CVR retrofit have been neglected and need to be addressed, as stated in Safety Recommendation A-82-107. Therefore, the Board reiterates Safety Recommendations A-82-109 through -111 on recorders for all multiengine, turbine-powered aircraft. The recommendations remain in an "Open—Unacceptable Action" status.

The Safety Board believes that a CVR would not only have been a valuable tool in analyzing this accident, but would be a positive force in developing measures to prevent similar accidents. Until the FAA requires the installation of CVRs, or airlines voluntarily install CVRs, similar accidents may occur and important preventive measures will go undetected.

As a result of this and two other approach phase accidents involving scheduled domestic passenger commuter flights operating under 14 CFR 135, which occurred in

^{5/} Aircraft Accident Report—"Sky Train Air, Inc., Gates Learjet 24, N44CJ, Felt, Oklahoma, October 1, 1981" (NTSB/AAR-82/4).

August 1985 and September 1985, and in which 30 persons were fatally injured, 6/ the Safety Board concludes that the time has come for the FAA and the commuter airline industry to install ground proximity warning systems (GPWS) aboard those aircraft commonly used by the commuter airlines for the commercial transport of 30 or fewer passengers. An advisory type of system to monitor height above the ground may have been sufficient to direct the flightcrews' attention to the possibility of ground contact in time to avoid an accident.

As an example of the terrain protection afforded by the GPWS, the Safety Board examined the alerting features of a GPWS product and applied the specifications to the flightpaths of the two airplanes involved in the accidents in Virginia and in Maine. In the Henson accident, the GPWS would have alerted approximately 29 seconds before impact. The same GPWS would have alerted at least 10 seconds—and possibly as much as 17 seconds—before impact in the Bar Harbor accident. In this accident, although the flightpath could not be reconstructed, it is clear that a GPWS would have provided an additional alert to the flightcrew of the continued descent below the glideslope and through decision height.

The Safety Board realizes that a full GPWS like those installed in large turbojet airplanes may be prohibitively expensive to retrofit into Part 135 type airplanes. However, other devices are available that could provide viable alternatives to a full GPWS. The Safety Board believes that the FAA and the commuter industry must address the installation of ground proximity warning devices in turbine-powered airplanes used by commuter air carriers for the commercial transport of 30 or fewer passengers.

The National Transportation Safety Board reiterates the following recommendations to the Federal Aviation Administration:

A-82-107

Require that all multiengine, turbine-powered, fixed-wing aircraft certificated to carry six or more passengers manufactured on or after a specified date, in any type of operation not currently required by 14 CFR 121.343, 122.359, and 135.151 to have a cockpit voice recorder and/or a flight data recorder, be prewired to accept a "general aviation" cockpit voice recorder (if also certificated for two-pilot operation) with at least one channel for voice communications transmitted from or received in the aircraft by radio, and one channel for audio signals from a cockpit area microphone, and a "general aviation" flight data recorder to record sufficient data parameters to determine the information in Table I as a function of time.

A-82-109

Require that "general aviation" cockpit voice recorders (on aircraft certificated for two-pilot operation) and flight data recorders be installed when they become commercially available as standard equipment in all multiengine, turbine-powered fixed-wing aircraft and rotorcraft certificated to carry six or more passengers manufactured on or after a specified date, in any type of operation not currently required by 14 CFR 121.343, 121.359, 135.151, and 127.127 to have a cockpit voice recorder and/or a flight data recorder.

6/ Aircraft Accident Reports—"Bar Harbor Airlines, Beech B99, N300WP, Auburn, Maine, August 25, 1985" (NTSB/AAR-86/06) and "Henson Airlines, Beech B99, Grottoes, Virginia, September 23, 1985 (NTSB/AR-86/07).

A-82-110

Require that "general aviation" cockpit voice recorders be installed as soon as they are commercially available in all multiengine, turbine-powered aircraft (both airplanes and rotorcraft), which are currently in service, which are certificated to carry six or more passengers and which are required by their certificate to have two pilots, in any type of operation not currently required by 14 CFR 121.359, 135.151, and 127.127 to have a cockpit voice recorder. The cockpit voice recorders should have at least one channel reserved for voice communications transmitted from or received in the aircraft by radio, and one channel reserved for audio signals from a cockpit area microphone.

A-82-111

Require that "general aviation" flight data recorders be installed as soon as they are commercially available in all multiengine, turbojet airplanes which are currently in service, which are certificated to carry six or more passengers in any type of operation not currently required by 14 CFR 121.343 to have a flight data recorder. Require recording of sufficient parameters to determine the following information as a function of time for ranges, accuracies, etc.:

- altitude
- indicated airspeed
- magnetic heading
- radio transmitter keying
- pitch attitude
- roll attitude
- vertical acceleration
- longitudinal acceleration
- stabilizer trim position
- pitch control position.

A-84-49

Seek legislative authority to use the NDR to identify airmen whose driving licenses have been suspended or revoked for alcohol-related offenses.

A-86-19

Provide, to all operators, guidance on topics and training in cockpit resource management so that operators can provide such training to their flightcrew members, until such time as the FAA's formal study of the topic is completed.

A-86-109

Amend 14 CFR 135.153 to require after a specified date the installation and use of ground proximity warning devices in all multiengine, turbinepowered fixed wing airplanes, certificated to carry 10 or more passengers.

The Safety Board also makes the following recommendations to the Federal Aviation Administration:

Provide to all military facilities that are the air traffic controlling units for civilian aircraft the equipment necessary to allow them to access weather information as quickly as Federal Aviation Administration facilities can. (Class II, Priority Action) (A-87-11)

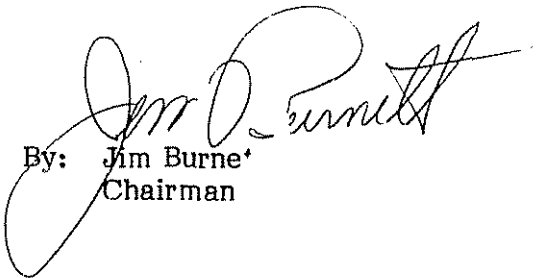
Encourage all operators of revenue passenger flights to establish alcohol rehabilitation programs for pilots with alcohol abuse problems. (Class II, Priority Action) (A-87-12)

Reexamine 14 CFR 91.11(a)(1) in the light of recent findings on the effects of alcohol consumption on pilot performance, and carry out the research needed to establish the minimum amount of time, following alcohol consumption, required by pilots to perform their duties without impairment. (Class II, Priority Action) (A-87-13)

Issue an Operations Bulletin to Principal Operations Inspectors of carriers operating under 14 CFR Part 135 informing them of the need to improve passenger screening to prevent intoxicated passengers from boarding aircraft. (Class II, Priority Action) (A-87-14)

Seek legislative authority to use the National Driver Register (NDR) to identify airmen whose driving licenses have been suspended or revoked for alcohol-related offenses. (Class II, Priority Action) (A-87-15)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER and NALL, Members, concurred in these recommendations.


By: Jim Burnett
Chairman