



National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: March 17, 1994

In reply refer to: A-94-73

Honorable David R. Hinson
Administrator
Federal Aviation Administration
Washington, D C. 20591

On April 29, 1993, at 1555 central daylight time, an Embraer EMB-120 RT, Brasilia, N24706, was substantially damaged when it collided with rough terrain during an overrun following a forced landing on runway 17 at the Grider Field Airport in Pine Bluff, Arkansas. The forced landing was executed after the airplane stalled and went out of control at approximately 17,000 feet during the climb to cruise altitude. The flightcrew regained control of the airplane after losing about 12,000 feet of altitude. However, after regaining control, the flightcrew noted that the left engine nacelle was extensively damaged, three of the four propeller blades were missing, and the airplane was unable to maintain level flight.

The airplane, owned by Continental Airlines, Inc., was operated by Continental Express, Inc., as Jet Link flight 2733. It was being flown by two airline transport pilot rated pilots under the provisions of Title 14 Code of Federal Regulations (CFR) Part 135 on a scheduled passenger flight from Adams Field Airport, Little Rock, Arkansas, to Intercontinental Airport, Houston, Texas. An instrument flight rules flight plan had been filed and visual meteorological conditions prevailed at the accident site. The loss of control, descent, and recovery of control occurred while the flight was in instrument meteorological conditions (IMC). Of the three crewmembers and 27 passengers aboard the airplane, the flight attendant and 12 passengers received minor injuries, while the two flightcrew members and remaining 15 passengers were not injured.¹

The investigation determined that the captain had selected the "pitch hold" mode on the autopilot and had increased pitch attitude in an attempt to increase the airplane's climb rate. Also, the captain was distracted by a conversation with the flight attendant and failed to detect the resultant reduction in airspeed until the stick shaker activated. The first officer was also inattentive as he entered data into the airplane's log book and ate his crew meal. Neither pilot observed an accretion of airframe ice after the flight climbed above the freezing level. The airplane stalled almost immediately after the stick shaker activated because of the effects of the

¹For more detailed information, read Aircraft Accident/Incident Summary Report--"Stall, Loss of Control, and Landing Overrun, Continental Express, Inc., N24706, Pine Bluff, Arkansas, April 29, 1993" (NTSB/AAR-94/02/SUM)

ice. The captain did not immediately recognize the stall condition and failed to relax control column force to recover in a timely manner.

The National Transportation Safety Board determined that the probable causes of this accident were the captain's failure to maintain professional cockpit discipline, his consequent inattention to flight instruments and ice accretion, and his selection of an improper autoflight vertical mode, all of which led to an aerodynamic stall, loss of control, and a forced landing. Factors contributing to the accident were poor crew discipline, including flightcrew coordination before the stall and the flightcrew's inappropriate actions to recover from the loss of control. Also contributing to the accident was fatigue induced by the flightcrew's failure to properly manage provided rest periods.

The accident flight came at the end of the crew's 3-day flight schedule. The first day of the schedule was demanding and culminated in a reduced rest period. The second day was short, with the crew going off duty about 1130 and not having to report back until 0530 the next day. The last day was perceived by the crew as being the most demanding because it was the end of the trip, and as the first officer said, "one is just ready to go home and see the family." The captain stated that the workload was slightly heavier on the last day due to having seven legs to fly in IMC.

The crew rest periods scheduled for the trip were within company guidelines and FARs. The crewmembers had sufficient opportunity on the second day of their flight schedule to get adequate rest; however, they did not take advantage of this opportunity. For the two nights before the accident, the pilots averaged only about 5 to 5 1/2 hours of sleep per night. The accident occurred after a long and relatively difficult day of flying and on the last leg when the crew anticipated getting home. Further, the accident occurred in the late afternoon when the human body normally reaches a physiological low level of performance and alertness. The Safety Board believes that the combined effects of cumulatively limited sleep, a demanding day of flying, and a time of day associated with fatigue indicated that fatigue had an effect on crew performance.

The Safety Board recently examined the 37 major air carrier accidents from 1978 through 1990 for which human performance issues were cited in the probable cause determination ("A Review of Flightcrew-Involved, Major Accidents of U.S. Carriers, 1978 through 1990" Safety Study NTSB/SS-94/01). Many human performance background variables were compared to the types of errors observed in the accident sequence in an effort to identify factors that might be useful in accident prevention. Several fatigue-related variables were examined--time since awakening, time of day, time zone crossings, and changing work schedules. It was found that the time since awakening for each pilot related to significant differences in performance, in terms of the number and types of errors made by pilots.

As a result of this safety study, the Safety Board recommended on February 4, 1994, that the FAA require U.S. air carriers operating under 14 CFR Part 121 to include, as part of pilot training, a program to educate pilots about the detrimental effects of fatigue, and strategies for

avoiding fatigue and countering its effects (A-94-5) The FAA has not yet responded to this recommendation.

Such a training program might have assisted the pilots in the present accident to better recognize their own symptoms of fatigue and to develop personal strategies to help lower its effects in their demanding work schedules.

Based on this information, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Require that 14 CFR Part 135 air carriers provide aircrews, as part of their initial and recurrent training, information on fatigue countermeasures relevant to the duty/rest schedules being flown by the company (Class II, Priority Action) (A-94-73)

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HAMMERSCHMIDT, and HALL concurred in this recommendation



By: Carl W. Vogt
Chairman