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ASSERT YOURSELF

The NTSB is pressing for enhanced CRM training, including lessons in how first officers should challenge their captains.



Crew resource management (CRM) training should be expanded to include assertiveness training for first officers, the U.S. National Transportation Safety Board (NTSB) says, citing a 2009 crash in which the first officer did not press the captain on his decision to continue an approach even as they struggled with problems associated with asymmetric flaps.

The NTSB's safety recommendation to the U.S. Federal Aviation Administration (FAA) called on the FAA to "require that role-playing or simulator-based exercises that teach first officers to assertively voice their concerns and that teach captains to develop a leadership style that supports first officer assertiveness be included as part of the already-required crew resource management training" for pilots in U.S. Federal Aviation Regulations (FARs) Part 121, 135 and 91 Subpart K operations.¹

The accident occurred about 0437 local time on Jan. 27, 2009, when an Empire Airlines Avions de Transport Régional Alenia ATR 42 crashed short of the runway during an instrument approach in icing conditions to Lubbock Preston Smith International Airport in Lubbock, Texas, U.S. The captain was seriously injured, and the first officer received minor injuries in the crash, which substantially damaged the airplane.²

The two pilots were the only people in the ATR 42, which was registered to FedEx Corp. and operated by Empire as a Part 121 supplemental cargo flight.

In the safety recommendation letter to FAA Administrator Randy Babbitt, the NTSB noted that the first officer had been flying the approach and that, when she called for the 15-degree approach-flap setting, the right flaps did not extend and the left flaps extended only partially.

The captain recognized that there was a problem with the flaps about 40 seconds later, when the airplane had descended to 1,400 ft above ground level (AGL), just outside the outer marker, which was also the final approach fix.

"Both the captain and the first officer had been trained to perform a go-around maneuver and reference the QRH [quick reference handbook] if a flap problem occurred during an approach," the NTSB said in the letter. "However, neither flight crewmember immediately called for a go-around maneuver or performed the QRH procedure for addressing flap anomalies.

"The captain, without discussing any plan of action with the first officer, instead began a nonstandard response to try to troubleshoot the flap problem; the first officer continued to fly the approach."

Neither pilot adequately monitored the airspeed, however, and the aural stall warning and the stick shaker activated "multiple times," the report said, noting that activation of the stick shaker is "another criterion for performing a go-around maneuver."

The first officer asked the captain if she should perform a go-around, but "he dismissed her request," the report said.

When the airplane reached 700 ft, the captain took the controls and continued the unstabilized approach. The stick shaker continued to activate; at 500 ft AGL, just below the clouds and descending at 2,050 fpm, the terrain awareness and warning system (TAWS) generated a "PULL UP" warning.

"Procedures for responding to either the stick shaker or the TAWS warning require the immediate application of maximum engine power," the report said. If the captain had responded by immediately beginning a go-around, he probably could have averted the stall and subsequent crash, the report added.

The NTSB's final report on the accident said that the first officer had told accident investigators that when the captain told her not to perform a go-around, she "felt that he had a good reason for not wanting to go around and that she trusted that he was making the right decisions."³

After the captain took over control of the airplane, she "was still concerned ... and felt that she should have called again for a go-around maneuver but ... she did not know why she did not say anything," the report said.



The NTSB characterized her failure to speak up as result of the “steep authority gradient in the cockpit” — the captain had 13,935 flight hours, extensive experience in flight in icing conditions and was referred to by his colleagues as a “guru,” while the first officer had 2,109 flight hours and very limited experience in icing conditions.

The NTSB noted that a number of studies since the 1970s have shown that too steep an authority gradient can impede flight crew performance, in part because first officers with limited experience are reluctant to question actions by captains who have accumulated many thousands of flight hours.

For example, the accident report cited a 1992 report on a study of 249 airline pilots in the United Kingdom in which nearly 40 percent of first officers said that they had “failed to communicate safety concerns to their captains on more than one occasion for reasons that included a desire to avoid conflict and deference to the captain’s experience and authority.”⁴

Other captains who had flown with the first officer told accident investigators that “although she did not seem to have a problem standing up for something in the cockpit, she asked a lot of questions when flying that were related to skills that she already knew,” the report said.

The first officer indicated that, on the accident flight, asking the captain if she should go around was “her way of saying that she wanted to go around without stepping on toes,” the report said.

The NTSB said that the CRM issues that were factors in this accident resembled the poor CRM in the Feb. 19, 1996, crash of a Continental Airlines McDonnell Douglas DC-9

in Houston. In that case, the captain rejected the first officer’s go-around request and the first officer failed to challenge the decision.⁵

The investigation of that accident resulted in the NTSB’s issuance of two safety recommendations calling on the FAA to require airlines to “make it clear to their pilots that there will be no negative repercussions for appropriate questioning, in accordance with CRM techniques, of another pilot’s decision or action and ensure that CRM programs provide pilots with training in recognizing the need for, and practice in, presenting clear, unambiguous communications of flight-related concerns.”

In response, the FAA issued Advisory Circular (AC) 120-51C, which emphasized that management must support a safety culture that promotes communications among flight crewmembers and must not allow for “negative repercussions for appropriate questioning of one pilot’s decision or action by another.”

Nevertheless, because the FAA did not issue a flight standards information bulletin on the subject, the NTSB classified the recommendations as closed, with unacceptable action from the FAA.

“Thirteen years after the FAA issued AC 120-51C, the NTSB continues to investigate accidents in which one pilot does not question the actions or decisions of another pilot,” the accident report said.

As for the 2009 accident, the NTSB said that the first officer’s CRM training had not included role-playing activities to help pilots gain assertiveness skills.

“Practice allows pilots to bridge the gap between their knowledge of assertiveness and the actions needed in the cockpit to effectively be assertive,” the report said. “Role-playing exercises

are essential for effective assertiveness training because such exercises provide flight crews with opportunities for targeted practice of specific behaviors and feedback that a lecture-based presentation format lacks.”

The NTSB recommendation, therefore, called on the FAA to require CRM training to be expanded to include role-playing or simulator exercises to teach first officers to “assertively voice their concerns and ... teach captains to develop a leadership style that supports first officer assertiveness.”

Notes

1. FARs Part 121 governs air carrier operations, Part 135 governs commuter and on-demand operations, and Part 91 Subpart K governs fractional ownership operations.
2. The NTSB said the probable cause of the accident was the crew’s “failure to monitor and maintain a minimum safe airspeed while executing an instrument approach in icing conditions, which resulted in an aerodynamic stall at low altitude.” Poor CRM was among four factors cited as contributing to the accident.
3. NTSB. Accident Report NTSB/AAR-11/02, *Crash During Approach to Landing, Empire Airlines Flight 8284, Avions de Transport Régional, Aerospatiale Alenia ATR 42-320, N902FX, Lubbock, Texas, January 27, 2009*. April 26, 2011.
4. The NTSB report cited the following: Wheale, J. “Crew Coordination on the Flight Deck of Commercial Transport Aircraft.” In *Proceedings of the Flight Operations Symposium, October 1983*. Dublin, Ireland: Irish Air Line Pilots Association/Aer Lingus.
5. Twelve of the 87 people in the airplane received minor injuries. The NTSB said the probable cause of the accident was the captain’s decision to continue the approach, despite the airline’s standard operating procedures that required a go-around.