

Air France Crash Report Points to Pilot Errors as Skills Undergo a Review

Salvage teams work to retrieve debris from the wreckage of Air France flight 447

(Bloomberg) - Airline pilots need better training on how to fly planes in an emergency with only limited aid from computers, investigators concluded after probing how cockpit confusion doomed Air France Flight 447 and killed 228 people.

Global aviation authorities should revise training for pilots and make changes to aircraft certification, flight recorders and transmission of flight data, the French BEA aircraft accident bureau said today in a report into the 2009 crash off the coast of Brazil.

The document chronicles the final two hours of the Airbus A330 aircraft, revealing an airplane and engines that responded accurately to commands, and confusion on the part of the two co-pilots making the inputs while the captain was off duty. Neither pilot appeared to realize the plane had stalled, even as an alarm sounded for 54 seconds before the jet hit the ocean in the middle of the night.

"There was no explicit task-sharing between the two copilots," the report said. "Neither of the pilots made any reference to the stall warning."

Flight 447 crashed on June 1, 2009, after the Airbus lost speed and stalled before beginning a 3 1/2 minute plunge into the Atlantic. No announcements were made to the passengers during the decent, the report said. Data presented by BEA show the youngest of the three pilots, who was 32 and at the controls for most of the last minutes, angled the jet nose higher, a position the aircraft maintained until its impact.

Air France Response

Air France said there was "no reason to question the crew's technical skills."

"Misleading stopping and starting of the stall warning alarm" confused the crew and contributed to the crash, it said in a statement published on its Web site in response to the report. "Air France pays tribute to the courage and determination they showed in such extreme conditions," it said.

Stalls occur when a plane slows to a degree that its wings lose lift. Recovering from a stall involves dropping the nose to regain airspeed, a procedure that novice pilots begin practicing early in their training. The aircraft's captain, who returned to the cockpit after the plane had stalled, had almost 11,000 hours of flying experience. That compares with 3,000 hours for the youngest of the three-man crew, who remained in control.

Recommendations

Among the agency's recommendations, it called for one crew member to be designated as a "relief captain" whenever copilots are left alone in the cockpit. The pilot left for his break "without clear operational instructions," the BEA said.

The recommendations are likely to rekindle debate about adequate pilot training in an era of aviation dominated by computers. Modern jets are highly automated, and computers ensure the aircraft remains in its so-called flight envelope.

Regulators should require pilot training to include "regular specific exercises aimed at manual airplane handling, including approach to and recovery from stall at high altitude," the BEA said.

The French investigator was able to piece together the last minutes of the doomed flight after retrieving the flight- and data recorders from the bottom of the ocean earlier this year following multiple search missions. Investigators recovered complete readings of the flight recorders, the BEA said.

Icy Sensors

Even before the recorders were found, the investigation honed in on the plane's airspeed sensors that malfunctioned after they were blocked by ice at cruising altitude, causing the auto-pilot to shut down while the captain was on a routine break.

The junior co-pilot responded by forcing the plane into a sharp climb, the report said. He continued to pull back on the stick even after the aircraft slowed, lost lift and dropped almost vertically with the stall alarm blaring. Speed indications returned after a 54-second lapse, though they had no impact on pilot behavior, the report concluded.

The audio recording of the cockpit exchanges reveals poor communication between the co-pilots and a lack of clear command in the flight captain's absence, according to the BEA. They failed to exchange information or observations on the plane's orientation and descent through the air. "No standard callouts regarding the differences in pitch attitude and vertical speed were made," the report said.

At one point, both men made simultaneous inputs on the side stick, a maneuver that prompts a vibrating warning on the steering device. While the captain had returned to the cockpit, he never took back the controls and remained in the background.

Captain Too Late

By the time the captain had rejoined his co-pilots, the situation had already deteriorated considerably, the investigators concluded in a report in May.

The pilot was among the victims recovered from the ocean surface in the weeks after the crash. Salvage crews managed to pull up the bodies of other victims from the sea bed after the jet was discovered earlier this year.

Among recommendations presented by investigators is the addition of cameras into the cockpit to enable a better reconstruction of the occurrences, a move that pilot unions have so far opposed as invasive.

Manufacturers should also consider making available a reading of the so-called angle of attack, which defines the angle between air flow and the longitudinal axis of the aircraft. In the case of the crashed Airbus, the angle, which wasn't available to the pilots, always remained above 35 degrees during the descent.

Data transmission during emergencies should also be improved, and the BEA recommended a mandatory activation of an emergency location transmitter to help find an aircraft, after the search for the boxes turned into the most elaborate salvage mission in aviation history. The Air France plane beamed its whereabouts by satellite only every 10 minutes, and crashed almost in the middle of that interval.

The report will be available here:

<http://www.bea.aero/en/enquetes/flight.af.447/flight.af.447.php>