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Testimony of the Honorable Mark V. Rosenker
Acting Chairman
National Transportation Safety Board
Before the
Subcommittee on Aviation
Committee on Transportation and Infrastructure
United States House of Representatives

Regional Air Carriers and Pilot Workforce Issues
June 11, 2009

Good morning. With your concurrence, Mr. Chairman, I would like to begin my testimony with a short summary of the National Transportation Safety Board's (NTSB) actions to date regarding the investigation of the accident involving Colgan Air flight 3407. I want to emphasize that this is still an ongoing investigation and that there is significant work left for our investigative staff. My testimony today will therefore out of necessity be limited to those facts that we have identified to date, and I will steer clear of any analysis of what we have found so far and avoid any ultimate conclusions that might be drawn from that information.

On February 12, 2009, about 10:17 p.m. eastern standard time, Colgan Air flight 3407, a Bombardier Dash 8-Q400, crashed during an instrument approach to runway 23 at Buffalo-Niagara International Airport, Buffalo, New York. The crash site was in Clarence Center, New York, about 5 nautical miles northeast of the airport, and was mostly confined to a single residential house. The flight was operating as a Part 121 scheduled passenger flight from Liberty International Airport, Newark, New Jersey.

The four crew members and 45 passengers were killed, and the aircraft was destroyed by impact forces and post crash fire. One person in the house was also killed and two individuals escaped with minor injuries.

The flight crew reported for duty on the day of the accident at 1:30 p.m. However, the crew's first two flights of the day were cancelled because of high winds at the departure airport. The accident flight, which had been delayed due to weather, departed Newark at 9:18 p.m. with a planned arrival time of 10:21 p.m.

The captain was the pilot flying the aircraft, and the cruise altitude was 16,000 feet. During the ascent to 16,000 feet, all de-ice systems were selected on and stayed on throughout the flight. About 40 minutes into the flight, the crew began the descent portion of the flight.

At 9:54 p.m., the captain briefed the airspeed for landing, which was to be 118 knots with the flaps set to 15 degrees. At 10:10 p.m., the flight crew discussed the build-up of ice on the windshield. At 10:12 p.m., the flight was cleared to 2300 feet and at 10:14 p.m., the airplane reached the assigned altitude. Over the next two minutes, with the autopilot engaged, power was reduced to near flight idle and the airspeed slowed from about 180 to about 135 knots. At 10:16

p.m., the crew lowered the landing gear. About 20 seconds later, the first officer moved the flaps from 5 to 10 degrees. Shortly afterward, the stick shaker activated, and the autopilot disengaged. The stick shaker is a stall warning mechanism that warns of slow airspeed and an approaching stall should the pilot take no action to remedy the situation. In this case, the stick shaker activated more than 25 knots before the stall airspeed.

The flight data recorder data from the airplane indicate that the crew added about 75% of available engine power and the captain moved the control column aft. This action was accompanied by the airplane pitching up, and a roll to the left, followed by a roll to the right, during which time the stick pusher activated and the flaps were retracted.

At the time of the accident, the weather at Buffalo was: winds from 250 degrees at 14 knots, visibility 3 miles in light snow and mist, a few clouds at 1100 feet, ceiling overcast at 2100 feet, and temperature of 1 degree Celsius.

Examination of the flight data recorder data and performance models shows that some ice accumulation was likely present on the airplane prior to the initial upset event, but that the airplane continued to respond as expected to flight control inputs throughout the accident sequence.

The engines exhibited evidence of power at impact. Flight control continuity could not be established due to the extensive impact and fire damage to the airplane.

On May 12, 2009, the NTSB began a 3-day en banc public hearing on the accident. The NTSB swore in 20 witnesses to discuss the following topics:

- Airplane Performance;
- Cold Weather Operations;
- Sterile Cockpit Compliance;
- Flight Crew Training and Performance; and
- Fatigue Management.

I would like to note that these issues are not relevant to regional airlines alone. They are pertinent to every airline operation, major air carriers as well as regional air carriers.

The investigation is continuing with aircraft performance and simulation work, additional interviews, reviews of policies and procedures, and further examination of selected wreckage. We've identified numerous safety issues that we will explore in significant detail.

During the hearing, the flight crew's experience and training were examined. The captain received his type rating in the Dash 8 in November 2008, only a few months before the crash. He had a total flight time of 3,379 hours, with 1,030 hours as pilot-in-command and 110.7 hours in the Dash 8. The first officer received second-in-command privileges on the Dash 8 in March 2008. She reported 2,244 hours total pilot time with 774 hours in the Dash 8.

The captain had a history of multiple FAA certificate disapprovals involving flight checks conducted before his employment with Colgan. The captain did not initially pass flight tests for the Instrument flight rating (October, 1991), the Commercial Pilot certificate (May, 2002), and the multiengine certificate (April, 2004). In each case, with additional training, the captain subsequently passed the flight tests and was issued the rating or certificate.

In 1995, the NTSB issued 4 recommendations to the FAA to require an airline to evaluate an applicant pilot's experience, skills, and abilities before hiring the individual. The FAA's effort in response to these recommendations resulted in the Pilot Records Improvement Act (PRIA) of 1996 (Public Law 104-264, section 502, which is codified in 49 *United States Code* section 44703 (h), (i), and (j)). The PRIA required any company hiring a pilot for air transportation request and receive records from any organization that had previously employed the pilot during the previous 5 years. However, the PRIA does not require an airline to obtain FAA records of failed flight checks. Although validation of FAA ratings and certifications held by a pilot applicant is necessary in evaluating a pilot's background, additional data contained in FAA records, including records of flight check failures and rechecks, would be beneficial for a potential employer to review and evaluate.

In 2005, the NTSB issued another recommendation to the FAA to require airlines, when considering an applicant for a pilot position, to perform a complete review of FAA airman records, including any notices of disapproval for flightchecks. In response to the NTSB's recommendation, the FAA stated that Notices of Disapproval for flight checks for certificates and ratings are not among the records explicitly required by the Pilot Records Improvement Act (PRIA) of 1996, and therefore, to mandate that air carriers obtain such notices would require rulemaking or a change in the PRIA itself. The FAA indicated that such changes are likely to be time consuming and controversial. The FAA noted that some air carriers currently require applicants for pilot positions to sign a consent form permitting the FAA to release these records to the air carrier requesting them as part of the applicants' pre-employment screening. When this is done, the FAA furnishes these records to the air carrier without violating privacy laws. To date, the FAA has not issued any rulemaking to require airlines to obtain a release from all flight crew applicants to release their records to permit the airline to consider past performance in hiring decisions. These changes could also be made by modifying the statute, but to our knowledge, the FAA has not asked the Congress to do so. On November 7, 2007, the FAA issued Advisory Circular AC120-68D, which informs carriers that they can ask pilots to sign a consent form giving the carrier access to any Notices of Disapproval. The recommendation is currently classified "Open-Acceptable Alternate Response."

The investigators also are pursuing why Colgan did not have a remedial training program in place as recommended in the FAA's 2006 Safety Alert for Operators (SAFO) 06015, the purpose of which was to promote voluntary implementation of remedial training programs for pilots with persistent performance deficiencies.

Specifically, the SAFO provides guidance to safety directors on the development of programs to identify pilots with persistent performance deficiencies, those who have experienced multiple failures in training and proficiency checks. It was suggested that three objectives be accomplished: 1) review the entire performance history of any pilot in question; 2) provide

additional remedial training as necessary; and 3) provide additional oversight by the certificate holder to ensure that performance deficiencies are effectively addressed and corrected.

The investigation is also exploring how commuting may have affected the pilots' performance. Both pilots were based in Newark, New Jersey, but lived outside of the Newark area. The captain commuted to Newark from Tampa, Florida, three days before the accident, and spent the night in Colgan's operations room the night before the accident. The first officer commuted from Seattle, Washington, on a "red eye" flight the night before the accident. She did not arrive into Newark until 6:30 a.m. the day of the accident flight, and there is evidence that she spent the day in the crew room.

Of the 137 Colgan pilots based at Newark in April 2009, 93 identified themselves as commuters. Forty-nine pilots have a commute greater than 400 miles, with 29 of these pilots living more than 1000 miles away.

During post-accident interviews, the Newark regional chief pilot said no restrictions were placed on pilots regarding commuting, but pilots had to meet schedule requirements. Colgan has a commuting policy that is outlined in its Flight Crewmember Policy Handbook. The handbook states "a commuting pilot is expected to report for duty in a timely manner." A previous edition of the handbook stated that flight crewmembers should not attempt to commute to their base on the same day they are scheduled to work. This statement is not in the current handbook edition. Additionally, Colgan's procedures do not allow pilots to sleep in the operations room.

The investigation is examining whether conversations inconsistent with the sterile cockpit rule (which prohibits crew members from engaging in non-essential conversation below 10,000 feet) impacted the pilots' situational awareness of the decreasing airspeed. For example, there was a 3-minute discussion on the crew's experience in icing conditions and training; this conversation occurred just a few minutes before the stick shaker activated and while the crew was executing the approach checklist.

Another issue that the investigation is pursuing is whether fatigue may have affected the flight crew's performance. We know that on the day of the accident, the captain logged into Colgan's crew scheduling computer system at 3:00 a.m. and 7:30 a.m. And we know that the first officer commuted to Newark on an overnight flight and was sending and receiving text messages periodically the day of the accident.

At the time of the accident, Colgan had a fatigue policy in place. The fatigue policy was covered in the basic indoctrination ground school. Colgan did not provide specific guidance to its pilots on fatigue management.

On April 29, 2009, Colgan issued an operations bulletin on crewmember fatigue. The bulletin reiterated the company's fatigue policy and provided information to crewmembers on what causes fatigue, how to recognize the signs of fatigue, how fatigue affects performance, and how to combat fatigue by properly utilizing periods of rest.

Once again, the issues we are exploring in the Colgan investigation are not new issues and are not unique to the regional airlines. The NTSB has previously issued recommendations on stall training, stick pusher training, pilot certification and recurrent training records, remedial training for pilots, sterile cockpit, situational awareness, pilot monitoring skills, low airspeed alerting systems, pilot professionalism, and fatigue. (See attachments.)

As you may know, the NTSB maintains a list of Most Wanted Transportation Safety Improvements. Issues on this list are selected for follow-up and heightened awareness because the Board believes they will significantly enhance the safety of the nation's transportation system, have a high level of public visibility and interest, and will otherwise benefit from being highlighted on the Most Wanted List. Of the six aviation issues currently on the Most Wanted List, two issue areas are in some manner related to the Colgan investigation. I would like to briefly explain the two issue areas, and recent FAA activities in response.

1. Reduce dangers to aircraft flying in icing conditions
2. Reduce accidents and incidents caused by human fatigue

Both of these issue areas currently have a red timeliness classification indicating that the FAA's response has not been acceptable from the NTSB's perspective. In many cases, the FAA's response has been slow in coming, allowing important safety issues that the NTSB has identified to remain unresolved for a lengthy period of time. The FAA has recently indicated that actions are being taken in response to some of these recommendations, and the NTSB is currently reviewing this information. Some of the details, and recent FAA actions for each area are:

- Flight in Icing Conditions: These recommendations date back to 1996, and ask that aircraft approved to fly in icing conditions be certified in icing conditions that represent the most serious threats. In the 13 years since these recommendations were issued, the FAA has not yet taken the requested action. Recent staff level discussions with the FAA revealed that they soon plan to propose changes to the certification regulations that include revised icing conditions that are more representative of the icing conditions that pose the greatest aviation safety risk. In 2007, the FAA issued an NPRM calling for activation and continuous operation of de-icing boots at the first signs of icing. The NTSB is still awaiting a final rule mandating this needed change.

- Human Fatigue: Human fatigue is another issue that has been on the Most Wanted List since it was created 19 years ago. In 1995, the FAA issued a notice of proposed rulemaking (NPRM) that addressed many of the issues identified by the NTSB. That NPRM was controversial and encountered considerable opposition. The FAA later withdrew the NPRM and has not proposed any further revisions to existing flight and duty time regulations. The regulations have not been significantly revised in over 50 years, although there has been substantial scientific-based research over that time frame that the NTSB believes supports changes in the existing flight and duty time regulations. Throughout the 19-year period that this issue has been on the Most Wanted List, right up through today,

the NTSB has continued to investigate accidents where flight crew fatigue was a significant issue.

Finally, I would like to address pilot training issues. As you are aware, on January 12, 2009, the FAA published an NPRM titled, "Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers." The notice proposes to amend the regulations for flight and cabin crewmembers and dispatcher training programs in domestic, flag, and supplemental operations. Proposed changes include requiring the use of flight simulation training devices (FSTD) in traditional flight crewmember training programs and adding training requirements in safety-critical areas. In addition, the proposal reorganizes qualifications and training requirements in the existing rule by moving several sections of advisory information to the regulatory section. The NPRM also addresses issues raised in numerous safety recommendations issued to the FAA by the NTSB; 13 of these recommendations remain open.

On May 7, 2009, the NTSB provided comments to the NPRM. While the NTSB generally supports the proposed rule changes, we suggested additional requirements, including substantive changes that would improve or enhance crew and dispatcher procedures, qualifications, and training and the replacement of advisory circulars and other recommended guidance with regulatory changes mandating compliance.

At an April 7, 2009, presentation on the NPRM, the NTSB was briefed that the FAA principle regarding training is "Train like you fly, and fly like you train." The NTSB agrees with this principle and with several proposed initiatives that are especially appropriate for flight operations in today's environment. For example, the NTSB supports the NPRM's proposals for adding a continuous analysis process and FSTDs to training programs, requiring special hazards and environment training, and establishing qualifications for training centers and other 14 *Code of Federal Regulations* (CFR) Part 119 facilities. The NTSB also concurred with the FAA that it is important for flight crewmembers to be trained and evaluated in a complete flight crew environment, which means that, during training for pilot flying and pilot monitoring roles, crewmembers should occupy the seats for—and perform the duties of—the position for which they are being trained.

The NTSB is aware that, in the past, some considered upset recovery training to be inappropriate due to limitations in aerodynamic model fidelity of simulators; however, unusual attitudes do not equate to being outside the angle of attack and sideslip range of the aerodynamic model. Many, if not most, upsets occur well within this envelope. Therefore, the NTSB supports the "Airplane Upset Recovery Training Aid," which is an FAA-industry effort referenced in the NPRM, and believes that training could be further improved by feedback to the pilot from the simulator. The training aid suggests that, in a scenario in which the pilot has maneuvered the simulator to an extremely high angle of attack or sideslip, there should be a change in the visual display when the aerodynamic envelope is exceeded; specifically, a color change would alert pilots that they are at an angle of attack or sideslip that should be avoided during recovery efforts.

The NTSB notes that some aircraft, such as the Saab 340 and the Bombardier CRJ, have experienced upsets due to premature stall caused by icing that disrupted the airflow over the

wing or otherwise altered the aerodynamic stall characteristics of the wing or control surface. Because icing contamination can cause the critical angle of attack to be reduced considerably, these upsets can occur without warning. A stall roll-off departure from normal flight is often the flight crew's first indication of an upset due to icing contamination; however, the NTSB has found that flight crews often do not apply decisive and timely recovery controls when this occurs, which results in prolonged upsets that increase the probability of ground impact. For aircraft that have experienced upsets due to icing contamination, the NTSB suggests that upset recovery training should include recognition of these excursions from normal flight attitudes and prompt application of proper recovery procedures.

Although the NPRM continues to encourage the traditional training approach to stall recovery (recovery from stick shaker), the NTSB is concerned that flight crews are not recognizing stalls and are not applying aggressive recovery procedures, as indicated by several aviation events. Among these events is the October 14, 2004, accident in which a Bombardier CL-600-2B19 crashed in Jefferson City, Missouri, when the flight crew was unable to recover after both engines flamed out as the result of a pilot-induced aerodynamic stall. Another example occurred during a December 22, 1996, accident in which a Douglas DC-8-63 experienced an uncontrolled flight into terrain in Narrows, Virginia, after the flying pilot applied inappropriate control inputs during a stall recovery attempt and the nonflying pilot failed to recognize, address, and correct these inappropriate control inputs. Because of examples like these, the NTSB advises that training in stall recovery should go beyond approach to stall to include training in recovery from a full stall condition. In addition, in cases when flight data are available (whether from flight tests or accidents/incidents), these data should be used to model stall behavior to facilitate training beyond the initial stall warning.

If the proposed rule becomes final, it would likely meet the intent of 5 of the 13 open safety recommendations related to crewmember training. The following is a list of the 13 recommendations and an explanation of whether or not the NPRM addresses each of them.

A-93-46
Amend 14 CFR Parts 121, 125, and 129 to require Traffic Alert and Collision Avoidance System [TCAS] flight simulator training for flight crews during initial and recurrent training. This training should familiarize the flight crews with TCAS presentations and require maneuvering in response to TCAS visual and aural alerts.

The NPRM contains requirements for TCAS training, as recommended. Therefore, the NPRM is responsive to the recommendation. If the NPRM (as currently presented) becomes a final rule, the NTSB would likely consider it an acceptable action, and the recommendation could be closed. The NTSB notes that this is currently the oldest open aviation recommendation.

A-94-107
Revise 14 CFR Section 121.445 to eliminate subparagraph (c), and require that all flight crewmembers meet the requirements for operation to or from a special airport, either by operating experience or pictorial means.

The NPRM proposes the following language for 14 CFR 121.1235(c): "The Administrator may determine that certain airports (due to items such as surrounding terrain, obstructions, or complex approach or departure procedures) are special airports requiring special airport qualifications and that certain areas or routes require a special type of navigation qualification." In addition, special routes, areas, and airports for special operations are among the subjects in the NPRM's list of required training. Therefore, the NPRM is responsive to the recommendation. If the NPRM (as currently presented) becomes a final rule, the NTSB would likely consider it an acceptable action, and this recommendation could be closed.

A-94-199
Revise the certification standards for Part 25 and for Part 23 (commuter category) aircraft to require that a flight simulator, suitable for flight crew training under Appendix H of Part 121, be available concurrent with the certification of any new aircraft type.

The NPRM proposes a requirement that a flight simulator be available for training. The NTSB has previously indicated that such a requirement would be an acceptable alternative response to a design requirement for an aircraft. Therefore, if the proposed rule becomes final, the NTSB would likely consider it an acceptable action, and this recommendation could be closed.

A-95-124
Require, by December 31, 1997, operators that conduct scheduled and nonscheduled services under 14 CFR Part 135 in Alaska to provide flight crews, during initial and recurrent training programs, aeronautical decision-making and judgment training that is tailored to the company's flight operations and Alaska's aviation environment, and provide similar training for Federal Aviation Administration principal operations inspectors [POI] who are assigned to commuter airlines and air taxis in Alaska, so as to facilitate the inspectors' approval and surveillance of the operators' training programs.

The FAA has previously indicated to the NTSB that the NPRM would include aeronautical decision-making and judgment in the crew resource management portion of the proposed training rule. However, this Safety Recommendation is specific to Part 135 operations in Alaska, while the NPRM addresses Part 121 operations. Therefore, the FAA has not supplied a satisfactory response. Thus, the NPRM, as drafted, would not meet the intent of this recommendation, and the status would remain "Open—Unacceptable Response."

A-96-95
Develop a controlled flight into terrain training [CFIT] program that includes realistic simulator exercises comparable to the successful windshear and rejected takeoff training programs and make training in such a program mandatory for all pilots operating under 14 CFR Part 121.

The NPRM proposes to require special hazards training, including methods for preventing CFIT and approach and landing accidents. Therefore, if this requirement is included in the final rule, the NTSB would likely consider it an acceptable action, and the recommendation could be closed.

A-96-120

Require 14 CFR Part 121 and 135 operators to provide training to flight crews in the recognition of and recovery from unusual attitudes and upset maneuvers, including upsets that occur while the aircraft is being controlled by automatic flight control systems, and unusual attitudes that result from flight control malfunctions and uncommanded flight control surface movements.

The NTSB is pleased that, in response to Safety Recommendation A-96-120, the NPRM includes training on recognizing and recovering from "special hazards," which are sudden or unexpected aircraft upsets. The NTSB interprets that this proposal would also include a requirement that gives FAA POIs the authority to review and require changes to training programs that do not adequately address a special hazard. Lack of such authority was a concern identified during the NTSB's investigation of a November 12, 2001, accident involving American Airlines flight 587, an Airbus Industrie A300-605R.[1] During this investigation, the NTSB learned that the POI knew that aspects of American Airlines' training program had undesirable effects; however, he lacked the authority to force American Airlines to change its program.

In addition, a topic covered in the special hazards training section of the NPRM is recovery from loss of control due to airplane design, airplane malfunction, human performance, and atmospheric conditions. The "Upset Recognition and Recovery" section of the NPRM lists a number of items that should be covered, including catastrophic damage due to rapidly reversing controls and the use of light pedal forces and small pedal movements to obtain the maximum rudder deflection as speed increases.

This recommendation is currently classified "Open—Unacceptable Response" because of the FAA's delayed response. Although the NPRM proposes requirements for Part 121 operators, similar action for Part 135 operators will be needed before Safety Recommendation A-96-120 can be closed.

A-98-102

Require air carriers to adopt the operating procedure contained in the manufacturer's airplane flight manual and subsequent approved revisions or provide written justification that an equivalent safety level results from an alternative procedure.

The FAA has previously indicated to the NTSB that the NPRM would address the issues in this recommendation. However, the NTSB did not see any language in the NPRM that specifically addresses Safety Recommendation A-98-102, which currently is classified "Open—Acceptable Response" pending a requirement for the recommended action.

A-01-85

Amend 14 [CFR] 121.417 to require participation in firefighting drills that involve actual or simulated fires during crewmember recurrent training and to require that those drills include realistic scenarios on recognizing potential signs of, locating, and fighting hidden fires.

The NPRM addresses the substantive issues in this recommendation. Although the NPRM does not propose to revise 14 CFR 121.417, it contains training requirements on the actions to take in

[1] For more information, see *In-Flight Separation of Vertical Stabilizer, American Airlines Flight 587, Airbus Industrie A300-605R, N14053, Belle Harbor, New York, November 12, 2001*, Aircraft Accident Report NTSB/AAR-04/04 (Washington, DC: NTSB, 2004).

the event of fire or smoke in the aircraft, including realistic drills with emphasis on combating hidden fires. This training includes simulated locations of hidden fires, such as behind sidewall panels, in overhead areas and panels, or in air conditioning vents. The NPRM also contains firefighting training requirements for flight attendants, including operation of each type of installed hand fire extinguisher. This recommendation is currently classified "Open—Unacceptable Response" pending a requirement for the recommended action. If the requirements proposed in the NPRM are enacted in the final rule, the NTSB would likely consider it an acceptable action, and this recommendation could be closed.

A-05-30
Require all 14 [CFR] Part 121 and 135 air carriers to incorporate bounced landing recovery techniques in their flight manuals and to teach these techniques during initial and recurrent training.

Although the NPRM contains detailed requirements for training on landing, the NTSB did not see anything in the NPRM related to bounced landing recovery techniques. This recommendation is currently classified "Open—Acceptable Alternate Response" pending the results of a survey indicating that all operators' training programs include the recommendations in a safety alert for operators.

A-07-44
Require that all 14 [CFR] Part 91K, 121, and 135 operators establish procedures requiring all crewmembers on the flight deck to positively confirm and cross-check the airplane's location at the assigned departure runway before crossing the hold short line for takeoff. This required guidance should be consistent with the guidance in Advisory Circular 120-74A and Safety Alert for Operators 06013 and 07003.

The NPRM contains training requirements related to runway safety. Special hazards topics must include how to ensure that takeoff clearance is received and that the correct runway is being entered for takeoff before crossing the hold-short line. This recommendation is currently classified "Open—Unacceptable Response" because of continuing delays in the issuance of this NPRM. If the NPRM becomes final, the proposed requirement is partly responsive to this recommendation because it addresses only Part 121 operators. Action will still be needed for Part 135 and Part 91 subpart K operators before this recommendation can be closed.

A-07-96
Require air carriers to revise their cabin crew training manuals and programs to ensure that the manuals and programs state that a door must remain open while the air conditioning (A/C) cart is connected, advise that the A/C cart can pressurize the airplane on the ground if all doors are closed, and warn about the dangers of opening any door while the air conditioning cart is supplying conditioned (cooled or heated) air to the cabin.

The NPRM proposes a requirement for training that will familiarize cabin crewmembers with each aircraft on which they will work. Among these aircraft familiarization requirements are cabin pressurization indicators and systems. However, the NPRM does not fully address the recommended action because it only addresses specific actions to take when the door remains

open while the A/C cart is connected. This recommendation is currently classified, and would remain, "Open—Acceptable Response" pending timely and acceptable revisions to Notice 8400.35 and Order 8900.1.

A-08-16
Require 14 [CFR] Part 121, 135, and Part 91 subpart K operators to include, in their initial, upgrade, transition, and recurrent simulator training for turbojet airplanes, (1) decision-making for rejected landings below 50 feet along with a rapid reduction in visual cues and (2) practice in executing this maneuver.

The NPRM proposes a requirement to use a simulator for training on rejected landing maneuvers, including the initiation of a rejected landing between 30 and 50 feet above the runway. Thus, the NPRM addresses the second part of this recommendation ("practice in executing this maneuver"). In addition, although the NPRM did not specifically address decision-making, this topic may be covered during training in the maneuver. Safety Recommendation A-08-16 is currently classified "Open—Response Received." The NPRM partially responds to the recommendation because it addresses only Part 121, and not Part 135 or Part 91 subpart K, carriers. Action for Part 135 and Part 91 subpart K operators will still be needed before this recommendation can be closed.

A-08-17
Require 14 [CFR] Part 121, 135, and Part 91 subpart K operators to include, in their initial, upgrade, transition, and recurrent simulator training for turbojet airplanes, practice for pilots in accomplishing maximum performance landings on contaminated runways.

The NTSB did not find any language describing how to accomplish maximum performance landings on contaminated runways in the NPRM. In addition, any proposed requirements associated with this NPRM would only apply to Part 121 carriers and not Part 135 or Part 91 subpart K operators. This recommendation is currently classified "Open—Response Received."

Mr. Chairman, this concludes my testimony, and I will be glad to answer questions you may have.

Attachments:

Recommendation history on:

- stall training;
- stick pusher training;
- pilot training records;
- remedial training for pilots;
- sterile cockpit;
- situational awareness;
- pilot monitoring skills;
- low airspeed alerting systems;
- pilot professionalism;
- and fatigue.

Recommendation Report

Monday, May 18, 2009

Log Number 0940

Issue Date 7/7/1978

THE NATIONAL TRANSPORTATION SAFETY BOARD IS CONCERNED BY THE CONTINUED OCCURRENCE OF STALL/SPIN ACCIDENTS IN RECENT YEARS. THE ACCIDENT STATISTICS ARE ALARMING AND REINFORCE OUR BELIEF THAT POSITIVE, INNOVATIVE ACTION BY THE FEDERAL AVIATION ADMINISTRATION MUST BE TAKEN TO ALLEVIATE THE SITUATION. FROM 1974 TO 1976, THERE WERE 723 STALL/SPIN ACCIDENTS WHICH RESULTED IN 568 FATALITIES AND 246 SERIOUS INJURIES. MANY OF THESE ACCIDENTS COULD HAVE BEEN PREVENTED IF FAA HAD IMPLEMENTED PAST SAFETY BOARD RECOMMENDATIONS RELATING TO STALL/SPIN PROBLEMS.

Recommendation #	Overall Status	Priority
A-78-043	CUA	CLASS I

INCORPORATE ALL OF THE ESSENTIAL ELEMENTS OF THE GROUND AND FLIGHT TRAINING INCREMENTS DEVELOPED IN THE "GENERAL AVIATION PILOT STALL AWARENESS TRAINING STUDY," OR THEIR EQUIVALENT, IN FAR PARTS 61 AND 141.

FAA	Closed - Unacceptable Action	2/3/1989

9/1/1978	Addressee	FAA LTR: WE BELIEVE THAT CERTAIN ELEMENTS CONTAINED IN THE GENERAL AVIATION PILOT STALL AWARENESS TRAINING STUDY SHOULD BE SURVEYED FOR POSSIBLE INCORPORATION INTO THE SECTIONS OF FAR PARTS 61 AND 141 WHICH DEAL WITH TRAINING IN STALL AWARENESS AND RECOVERY. ACTION IS CURRENTLY UNDERWAY TO IDENTIFY RELEVANT ELEMENTS AND INCORPORATE THEM INTO REGULATORY PROPOSALS FOR UPDATING PILOT TRAINING STANDARDS. WE EXPECT TO COMPLETE THIS SURVEY BY MARCH 1979.
10/8/1980	NTSB	The faa letter of september 1, 1978, indicated that a survey wasexpected to be completed by march 1979, and if the results of the survey indicated rulemaking to be appropriate, regulatory projects would be established. In order to evaluate the status of this recommendation and bring the public docket up to date, we would appreciate a progress report.
11/13/1980	Addressee	FEDERAL AVIATION ADMINISTRATION LTR: THE STALL AWARENESS TRAINING STUDY WILL BE INCLUDED, IN ITS ENTIRETY, INTO FAR PARTS 61 AND 141 AGENDA FOR CONSIDERATION IN THE UPGRADING OF PILOT TRAINING STANDARDS. THE FAA IS PLANNING A REGULATORY REVIEW OF FAR PARTS 61 AND 141 DURING THE CURRENT FISCAL YEAR. WE ARE FULLY AWARE OF THE IMPORTANCE OF THIS ACTION AND ARE HOPEFUL THAT WORK CAN BEGIN DURING THIS CALENDAR YEAR. IN THE MEANTIME, THE FAA HAS WRITTEN TO ALL INDUSTRY SPONSORS OF FAA APPROVED FLIGHT INSTRUCTOR REFRESHER COURSES TO INCLUDE TRAINING ON STALL SPIN AWARENESS. FURTHER, THE FAA EXAMINER STANDARDIZATION SECTION HAS INCLUDED A UNIT OF INSTRUCTION ON STALL SPIN AWARENESS TO ALL PILOT EXAMINERS. THE INTENT OF THESE ACTIONS IS TO INFORM THE FLIGHT INSTRUCTORS AND PILOT EXAMINERS OF THE ELEMENTS OF STALL SPIN AWARENESS TRAINING.
12/1/1986	Addressee	THE STALL AWARENESS TRAINING STUDY WILL BE INCLUDED IN ITS ENTIRETY, INTO FAR PARTS 61 AND 141 AGENDA FOR CONSIDERATION IN THE UPGRADING OF PILOT TRAINING STANDARDS. THE FAA IS PLANNING A REGULATORY REVIEW OF FAR PARTS 61 AND 141 DURING THE CURRENT FISCAL YEAR. WE ARE FULLY AWARE OF THE IMPORTANCE OF THIS ACTION AND ARE HOPEFUL THAT WORK CAN BEGIN DURING THIS CALENDAR YEAR. IN OUR JUDGEMENT, THESE ACTIONS WILL SATISFY THE INTENT OF SAFETY RECOMMENDATION A-78-43. WE WILL KEEP THE BOARD INFORMED OF THE STATUS OF UPGRADING FAR PARTS 61 AND 141.
12/1/1986	NTSB	In a letter dated november 13, 1980, we were informed that the faa was planning a regulatory review of far parts 61 and 141 in fy 1981 andwould include the general aviation pilot stall awareness training study in the agenda. Based on this information, the safety board in a letter dated december 16, 1980, classified this recommendation as open--acceptable action. However, we have not received any further response from the faa and would appreciate being informed of the present status of the review. In the expectation that the faa intends to take action as planned, we are main- taining a-78-43 in an open--acceptable action status.

Recommendation Report

Friday, May 15, 2009

Log Number 2527

Issue Date 10/24/1994 COLUMBUS OH 1/7/1994

ON JANUARY 7, 1994, A JETSTREAM J4101, N304UE, OPERATED BY ATLANTIC COAST AIRLINES AS UNITED EXPRESS FLIGHT 6291, WAS ON A SCHEDULED FLIGHT FROM DULLES INTERNATIONAL AIRPORT TO PORT COLUMBUS INTERNATIONAL AIRPORT, IN GAHANNA, OHIO. AT 2321 EASTERN STANDARD TIME, WHILE ON AN INSTRUMENT LANDING SYSTEM APPROACH TO RUNWAY 28L, THE AIRPLANE STRUCK A CONCRETE BLOCK BUILDING THAT WAS ABOUT 1.2 MILES EAST OF THE RUNWAY. THE PILOT, CO-PILOT, FLIGHT ATTENDANT, AND TWO PASSENGERS WERE FATALLY INJURED. THE THREE OTHER PASSENGERS, A HUSBAND AND WIFE AND THEIR 5-YEAR-OLD DAUGHTER, SUSTAINED MINOR INJURIES. THE AIRPLANE WAS DESTROYED BY POSTCRASH FIRE.

Recommendation # A-94-173

Overall Status: CAA

Priority: CLASS II

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: ENSURE THAT THE TRAINING PROGRAMS FOR 14 CODE OF FEDERAL REGULATIONS PART 135 PILOTS PLACE AN INCREASED EMPHASIS ON STALL WARNING RECOGNITION AND RECOVERY TECHNIQUES, TO INLCUDE STICK SHAKER AND STICK PUSHER, DURING TRAINING.

FAA	Closed - Acceptable Action	11/14/1995

12/21/1994	Addressee	THE FAA AGREES WITH THIS RECOMMENDATION. THE FAA WILL ISSUE A FLIGHT STANDARDS INFO BULLETIN DIRECTING PRINCIPAL OPERATIONS INSPECTORS TO ENSURE THAT THEIR APPROPRIATE OPERATORS PLACE EMPHASIS ON STALL WARNING RECOGNITION & RECOVERY TECHNIQUES, INCLUDING STICK SHAKER & STICK PUSHER, DURING TRAINING.
4/27/1995	NTSB	THE BOARD NOTES THAT THE FAA WILL ISSUE A FLIGHT STANDARDS INFO BULLETIN DIRECTING ALL PRINCIPAL OPERATIONS INSPECTORS TO ENSURE THAT THEIR APPROPRIATE OPERATORS PLACE EMPHASIS ON STALL WARNING RECOGNITION & RECOVERY TECHNIQUES, INCLUDING STICK SHAKER & STICK PUSHER, DURING TRAINING. THEREFORE, THE BOARD CLASSIFIES A-94-173 "OPEN--ACCEPTABLE RESPONSE & AWAITS RECEIPT OF A COPY OF THE SUBJECT BULLETIN.
8/7/1995	Addressee	THE FAA ISSUED FLIGHT STANDARDS INFO BULLETIN 95-10A, INSTRUMENT APPROACH PROCEDURES & TRAINING. THIS BULLETIN BECAME EFFECTIVE 6/26/95, & DIRECTS PRINCIPAL OPERATIONS INSPECTORS TO ENSURE THAT THEIR APPROPRIATE 14 CFR PART 135 OPERATORS PLACE EMPHASIS ON STALLWARNING RECOGNITION & RECOVERY TECHNIQUES, INCLUDING STICK SHAKER & STICK PUSHER, DURING TRAINING.
11/14/1995	NTSB	THE BOARD NOTES THAT THE FAA ISSUED FLIGHT STANDARDS INFO BULLETIN 95-10A, "INSTRUMENT APPROACH PROCEDURES & TRAINING," WHICH BECAME EFFECTIVE 6/26/95. THE FSIB DIRECTS ALL PRINCIPAL OPERATIONS INSPECTORS TO ENSURE THAT THEIR APPROPRIATE OPERATORS PLACE EMPHASIS ON STALL WARNING RECOGNITION & RECOVERY TECHNIQUES, INCLUDING STICK SHAKER & STICK PUSHER, DURING TRAINING. BECAUSE THE FSIB COMPLIES WITH THE INTENT OF THE RECOMMENDATION, A-94-173 IS CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation Report

Monday, May 11, 2009

Log Number 2576

Issue Date 11/15/1995 RALEIGH-DURHAM NC 12/13/1994

ON 12/13/94, A FLAGSHIP AIRLINES JETSTREAM 3201, DOING BUSINESS AS (DBA) AMERICAN EAGLE (AMR) FLIGHT 3379, CRASHED ABOUT 4 NAUTICAL MILES SOUTHWEST OF THE RUNWAY 5L THRESHOLD DURING AN INSTRUMENT LANDING SYSTEM APPROCH TO THE RALEIGH-DURHAM INTERNATIONAL AIRPORT (RDU). THE FLIGHT WAS REGULARLY SCHEDULED PASSENGER FLIGHT UNDER 14 CODE OF FEDERAL REGULATIONS (CFR), PART 135. THIRTEEN PASSENGERS & THE TWO CREWMEMBERS WERE FATALLY INJURED, & THE OTHER FIVE PASSENGERS SURVIVED. THE AIRPLANE WAS DESTROYED BY IMPACT & FIRE. THE WEATHER AT THE TIME OF THE ACCIDENT WAS CEILING 500 FEET, VISIBILITY 2 MILES, LIGHT RAIN & FOG, TEMPERATURE 38 DEGREES F, & DEW POINT 36 DEGREES F.

Recommendation # A-95-116

Overall Status: CR

Priority: CLASS II

THE NTSB RECOMMENDS THAT THE FAA: REQUIRE ALL AIRLINES OPERATING UNDER 14 CFR PARTS 121 & 135 & INDEPENDENT FACILITIES THAT TRAIN PILOTS FOR THE AIRLINES TO MAINTAIN PERTINENT STANDARDIZED INFO ON THE QUALITY OF PILOT PERFORMANCE IN ACTIVITIES THAT ASSESS SKILLS, ABILITIES, KNOWLEDGE, & JUDGMENT DURING TRAINING, CHECK FLIGHTS, INITIAL OPERATING EXPERIENCE, & LINE CHECKS & TO USE THIS INFO IN QUALITY ASSURANCE OF INDIVIDUAL PERFORMANCE & OF THE TRAINING PROGRAMS.

FAA	Closed - Reconsidered	1/3/2000

2/13/1996 Addressee

THE FAA RESPONDED THAT THE CURRENT REGULATIONS (14 CFR 121 APPENDIX E & F) CONTAIN ADEQUATE MANEUVERS & PROCEDURES, WITH "...STANDARDIZED INFO NEEDED TO ASSESS PILOT PERFORMANCE ADEQUATELY." THEY ALSO COMMENTED ON THE RECENT ISSUANCE OF A FINAL RULE, AIR CARRIER & COMMERCIAL OPERATOR TRAINING PROGRAMS, WHICH UPGRADED THE TRAINING, CHECKING & QUALIFICATION REQUIREMENTS FOR 14 CFR 135 OPERATORS, & MANDATED CREW RESOURCE MANAGEMENT TRAINING.

7/15/1996 NTSB

THE BOARD NOTES THAT THE FAA BELIEVES THAT CURRENT RULES, AS SPECIFIED IN 14 CFR PART 121 APPENDIXES E & F, PROVIDE THE STANDARDIZED INFO NEEDED TO ASSESS PILOT PERFORMANCE ADEQUATELY. IN ADDITION, ON 12/8/95, THE FAA ISSUED A FINAL RULE ENTITLED, "AIR CARRIER & COMMERICAL OPERATOR TRAINING PROGRAM," WHICH REQUIRES CERTAIN CERTIFICATE HOLDERS OPERATING UNDER PART 135 TO COMPLY WITH THE TRAINING, CHECKING, & QUALIFICATIONS REQUIREMENTS OF PART121. THUS ASSURING THAT THE TRAINING & CHECKING REQUIREMENTS OF THOSE OPERATING UNDER PART 135 WILL MEET THE SIMILAR REQUIREMENTS OF PART 121. HOWEVER, THE BOARD BELIEVES THAT THE EXISTING REQUIREMENTS OF PART 121 DO NOT PROVIDE THE TYPE OF RECORDKEEPING REQUIREMENTS URGED IN THIS RECOMMENDATION. IN FACT, APPENDIXES E & F WERE IN EFFECT AT THE TIME OF THE BOARD'S INVESTIGATION OF THE ACCIDENT TO WHICH THIS RECOMMENDATION WAS ADDRESSED (THE AMERICAN EAGLE JETSTREAM 3201 CRASH AT MORRISVILLE, NORTH CAROLINA, ON 12/13/94). IN THE INVESTIGATION OF THIS ACCIDENT, THE BOARD WAS UNABLE TO LOCATE THE TYPE OF INSTRUCTOR COMMENTS ON THE QUALITY OF THE CAPTAIN'S PERFORMANCE IN ACTIVITIES THAT TRAIN OR ASSESS THE NECESSARY PILOT SKILLS, ABILITIES, KNOWLEDGE, & JUDGMENT REQUIRED OF PILOTS OPERATING UNDER PART 135 & 121 IN THE CAPTAIN'S OFFICIAL PERSONNEL & TRAINING FILES. MOREOVER, THE BOARD LEARNED THAT THE AIRLINE MANAGEMENT ITSELF WAS UNAWARE OF CRITICAL ASPECTS OF THE CAPTAIN'S PERFORMANCE, DESPITE THE MANAGEMENT'S ADHERENCE TO THE PROVISION OF APPENDIXES E & F, PERHAPS BECAUSE SUCH INFO WAS ABSENT FROM THE AIRLINE'S OFFICIAL PERSONNEL & TRAINING FILES ON THE CAPTAIN. CONSEQUENTLY, THE BOARD CLASSIFIES A-95-116 "OPEN--UNACCEPTABLE RESPONSE" & REQUESTS THAT THE FAA RECONSIDER ITS POSITION ON THIS RECOMMENDATION.

2/11/1997 Addressee

THE FAA BELIEVES THAT THE MANEUVERS & PROCEDURES FOR AIR CARRIER TRAINING & QUALIFICATION CONTAINED IN 14 CFR PART 121, APPENDIXES E & F, PROVIDE THE STANDARDIZED INFO NEEDED TO ASSESS PILOT PERFORMANCE OF PILOTS REQUIRED TO TRAIN UNDER 14 CFR PART 121, SUBPART N & O.

Recommendation Report

Monday, May 16, 2005

REC:A-05-014

Log Number 2931

Issue Date 5/31/2005 Memphis TN 12/18/2003

On December 18, 2003, about 1226 central standard time, Federal Express Corporation (FedEx) flight 647, a Boeing MD-10-10F (MD-10),1 N364FE, crashed while landing at Memphis International Airport (MEM), Memphis, Tennessee. The right main landing gear collapsed after touchdown on runway 36R, and the airplane veered off the right side of the runway. After the gear collapsed, a fire developed on the right side of the airplane. Of the two flight crewmembers and five nonrevenue FedEx pilots2 on board the airplane, the first officer and one nonrevenue
pilot received minor injuries during the evacuation. The postcrash fire destroyed the airplane's right wing and portions of the right side of the fuselage. Flight 647 departed from Metropolitan Oakland International Airport, Oakland, California, about 0832 (0632 Pacific standard time) and was operating under the provisions of 14 Code of Federal Regulations (CFR) Part 121 on an instrument flight rules flight plan.

Recommendation # A-05-014

Overall Status
OAAR

Priority

The National Transportation Safety Board recommends that the Federal Aviation Administration: Require all 14 Code of Federal Regulations Part 121 air carrier operators to establish programs for flight crewmembers who have demonstrated performance deficiencies or experienced failures in the training environment that would require a review of their whole performance history at the company and administer additional oversight and training to ensure that performance deficiencies are addressed and corrected.

FAA	Open Acceptable Alternate Response

9/8/2005 Addressee

Letter Mail Controlled 9/14/2005 3:07:09 PM MC# 2050430 Marion C. Blakey, Administrator, FAA, 9/8/05: The Federal Aviation Administration agrees with the intent of this safety recommendation. Many 14 CFR Part 121 certificate holders already have, in place, voluntary programs of review, oversight, and remedial training developed in cooperation with their respective pilots' collective bargaining unit representatives. These voluntary programs have been shown to be effective. The FAA will issue a notice by December 2005 recommending that all 14 CFR Part 121 certificate holders develop and implement a program consistent with the intent of this safety recommendation.
I will provide the Board with a copy of the notice as soon as it is issued.

1/19/2006 NTSB

The FAA stated that many 14 CFR Part 121 air carriers already have voluntary programs of review, oversight, and remedial training. The FAA further stated that it will issue a notice recommending that all 14 CFR Part 121 certificate holders develop and implement a program consistent with the intent of this safety recommendation.

The Safety Board believes that the FAA's proposed action of issuing a notice instead of requiring the establishment of these programs may be an acceptable alternative, so long as the FAA can readily report to the Board how many carriers have established a program. Pending issuance of the notice and confirmation that all Part 121 carriers have established the recommended program, Safety Recommendation A-05-14 is classified "Open-Acceptable Alternate Response."

4/13/2007 Addressee

Letter Mail Controlled 4/27/2007 8:49:34 AM MC# 2070178:Marion C. Blakey, Administrator, FAA, 4/13/07 The Federal Aviation Administration has issued Safety Alert for Operators (SAFO) 06015 (copy enclosed), recommending implementation and incorporation of a voluntary remedial Part 121 pilot training module to supplement an air carriers' approved training program. Directors of Safety of Part 121 certificate holders that do not have a voluntary remedial training module for pilots should recommend this type of program to top managers of air carriers. This remedial training program should initiate the review of pilot's performance history, provide additional remedial training and engage the representatives of pilots to accomplish the objectives of SAFO 06015.
I believe that the FAA has satisfactorily responded to this safety recommendation, and I look forward to your response.

Recommendation Report

Tuesday, August 05, 2008

Log Number 1955
Issue Date 3/19/1987 MILWAUKEE WI 9/6/1985

AT 1521 C.D.T. ON SEPTEMBER 6, 1985, MIDWEST EXPRESS AIR LINES, INC. (MIDWEST EXPRESS), FLIGHT 105, A MCDONNELL DOUGLAS DC-9-14 AIRPLANE, CRASHED INTO AN OPEN FIELD AT THE EDGE OF A WOODED AREA ABOUT 1,680 FEET SOUTHWEST OF THE DEPARTURE END OF RUNWAY 19R SHORTLY AFTER TAKING OFF FROM GENERAL BILLY MITCHELL FIELD, MILWAUKEE, WISCONSIN. THE WEATHER WAS CLEAR WITH VISIBILITY 10 MILES. DURING THE INITIAL CLIMB, ABOUT 450 FEET ABOVE GROUND LEVEL (A.G.L.), THERE WAS A LOUD NOISE AND A LOSS OF POWER ASSOCIATED WITH AN UNCONTAINED FAILURE OF THE 9TH TO 10TH STAGE HIGH PRESSURE COMPRESSOR SPACER OF THE RIGHT ENGINE. FLIGHT 105 CONTINUED TO CLIMB TO ABOUT 700 FEET A.G.L. AND THEN ROLLED TO THE RIGHT UNTIL THE WINGS WERE OBSERVED IN A NEAR VERTICAL, APPROXIMATELY RIGHT 90 DEGREE BANKED TURN. DURING THE ROLL, THE AIRPLANE ENTERED AN ACCELERATED STALL, CONTROL WAS LOST, AND THE AIRPLANE CRASHED. THE AIRCRAFT WAS DESTROYED BY IMPACT FORCES AND POSTCRASH FIRE. THE PILOT, THE FIRST OFFICER, BOTH FLIGHT ATTENDANTS, AND ALL 27 PASSENGERS WERE FATALLY INJURED.

Recommendation # A-87-008

Overall Status CAA
Priority CLASS II

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: ISSUE AN AIR CARRIER OPERATIONS BULLETIN DIRECTING PRINCIPAL OPERATIONS INSPECTORS TO REVIEW THEIR RESPECTIVE AIR CARRIER'S FLIGHTCREW TRAINING PROGRAMS TO ENSURE THE EXISTENCE OF NEW COORDINATION PROCEDURES THAT, NOTWITHSTANDING A POLICY ENDORSING NONESSENTIAL CONVERSATION DURING AN EMERGENCY CONDITION, REQUIRE ANY CREWMEMBER WHO OBSERVES A POTENTIAL OR ACTUAL EMERGENCY SITUATION TO VERBALLY CALL IT TO THE CAPTAIN'S ATTENTION.

FAA	Closed - Acceptable Action	4/13/1988

5/29/1987	Addressee	THE FAA CONCURS THAT THE FAILURE OF A CREWMEMBER TO CALL OUT VERBALLY A POTENTIAL OR ACTUAL EMERGENCY SITUATION COULD LEAD TO DISASTER AND BELIEVES THIS FACT SHOULD BE EMPHASIZED. THEREFORE, AN AIR CARRIER OPERATIONS BULLETIN (ACOB) WILL BE ISSUED ON THIS SUBJECT. THE ESTIMATED COMPLETION DATE FOR THIS ACOB IS SEPTEMBER, 1987.
7/21/1987	NTSB	We are pleased that the FAA concurs in these recommendations and will, accordingly, issue air carrier operations bulletins by September 1987. Pending your further response, these recommendations are classified "Open--Acceptable Action."
4/13/1988	Addressee	THE FAA HAS ISSUED ACOB 8-88-2, REQUIRE ANY CREWMEMBER WHO OBSERVES A POTENTIAL OR ACTUAL EMERGENCY SITUATION TO VERBALLY CALL IT TO THE CAPTAIN'S ATTENTION. THIS ACOB DIRECTS PRINCIPAL OPERATIONS INSPECTORS TO ENSURE THAT THEIR ASSIGNED CARRIERS DO NOT TEACH THE CONCEPT OF "SILENT COCKPIT" IN THEIR PILOT TRAINING PROGRAMS. I HAVE ENCLOSED A COPY OF THE ACOB FOR THE BOARD'S INFORMATION.
5/26/1988	NTSB	We are pleased that the FAA has issued Air Carrier Operations Bulletin (ACOB) No. 8-88-2, to require any crewmember who observes a potential or actual emergency situation to verbally call it to the captain's attention. This recommendation is classified as "Closed--Acceptable Action."

Recommendation Report

Monday, May 18, 2009
REC:A-96-106

Log Number 2612
Issue Date 10/16/1996 BUGA COL 12/20/1995

ON 12/20/95, ABOUT 2142 EASTERN STANDARD TIME, AMERICAN AIRLINES (AAL) FLIGHT 965, A REGULARLY SCHEDULED PASSENGER FLIGHT FROM, MIAMI, FLORIDA, TO CALI, COLOMBIA, STRUCK A TREES AND THEN CRASHED INTO THE SIDE OF A MOUNTAIN NEAR BUGA, COLOMBIA, IN NIGHT, VISUAL METEOROLOGICAL CONDITIONS, WHILE DESCENDING INTO THE CALI AREA. THE AIRPLANE CRASHED 33 MILES NORTHEAST OF THE CALI (CLO) VERY HIGH FREQUENCY OMNIDIRECTIONAL RADIO RANGE (VOR) NAVIGATION AID. THE AIRPLANE WAS DESTROYED, AND ALL BUT FOUR OF THE 163 PASSENGERS AND CREW ON BOARD WERE KILLED.

Recommendation # A-96-106

Overall Status: CAA
Priority: CLASS II

THE NTSB RECOMMENDS THAT THE FAA: REVISE ADVISORY CIRCULAR 120-51B TO INCLUDE SPECIFIC GUIDANCE ON METHODS TO EFFECTIVELY TRAIN PILOTS TO RECOGNIZE CUES THAT INDICATE THAT THEY HAVE NOT OBTAINED SITUATIONAL AWARENESS, & EFFECTIVE MEASURES TO OBTAIN THAT AWARENESS.

FAA	Closed - Acceptable Action	3/1/1999

12/31/1996	Addressee	THE FAA WILL FUND A RESEARCH PROJECT TO DETERMINE CUES WHICH FLIGHT CREWMEMBERS CAN READILY RECOGNIZE TO INDICATE SITUATIONAL AWARENESS PROBLEMS. THIS PROJECT WILL FOCUS ON DEVELOPING SPECIFIC CUES FOR SITUATIONAL AWARENESS IN AUTOMATED COCKPITS. AS SOON AS THIS PROJECT IS COMPLETED, THE FAA WILL REVISE ADVISORY CIRCULAR 120-51B TO INCLUDE GUIDANCE ON TRAINING THE CREWS ON CUE RECOGNITION. I WILL KEEP THE BOARD INFORMED OF THE FAA'S PROGRESS ON THIS RECOMMENDATION.
4/11/1997	NTSB	A-96-106 ASKED THE FAA TO REVISE AC 120-51B TO INCLUDE SPECIFIC GUIDANCE ON METHODS TO EFFECTIVELY TRAIN PILOTS TO RECOGNIZE CUES THAT INDICATE THAT THEY HAVE NOT OBTAINED SITUATIONAL AWARENESS, & PROVIDE EFFECTIVE MEASURES TO OBTAIN THAT AWARENESS. PENDING THE BOARD'S EVALUATION OF THE FAA'S COMPLETED ACTION, A-96-106 IS CLASSIFIED "OPEN--ACCEPTABLE RESPONSE."
6/29/1998	Addressee	Letter Mail Controlled 7/7/98 3:57:35 PM MC# 980845
8/3/1998	Addressee	(Letter Mail Controlled 8/5/98 3:49:30 PM MC# 980977) THE FAA FUNDED A RESEARCH PROJECT TO DETERMINE CUES WHICH FLIGHT CREWMEMBERS CAN READILY RECOGNIZE TO INDICATE SITUATIONAL AWARENESS PROBLEMS. THE RESEARCH FOCUSED ON DEVELOPING SPECIFIC CUES FOR SITUATIONAL AWARENESS IN AUTOMATED COCKPITS. THE RESULTS OF THIS RESEARCH PROJECT ARE OUTLINED IN A REPORT ENTITLED "GUIDELINES FOR SITUATION AWARENESS TRAINING," WHICH WAS PUBLISHED IN FEBRUARY 1998. THE REPORT INCLUDES AN OVERVIEW, SPECIFIC TRAINING TIPS, & SAMPLE TRAINING COURSES FOR USE BY THE AVIATION COMMUNITY. THE REPORT HAS BEEN WELL-RECEIVED BY AIR CARRIER OPERATORS & CONTAINS CONCEPTS & GUIDANCE FOR INSPECTORS IN ASSESSING CREW RESOURCE MANAGEMENT TRAINING OF THEIR OPERATORS. THE REPORT IS ALSO POSTED ON THE FAA AIR CARRIER TRAINING HOME PAGE(HTTP://WWW.FAA-GOV/AVR/AFS/TRAIN.HTM>). THE FAA WILL INCORPORATE GUIDANCE ON CUE RECOGNITION TRAINING FOR CREWMEMBERS IN ADVISORY CIRCULAR (AC) 121-51B, CREW RESOURCE MANAGEMENT TRAINING. I WILL PROVIDE THE BOARD WITH A COPY OF THE AC AS SOON AS IT IS REVISED.
11/2/1998	NTSB	A-96-106 ASKED THE FAA TO REVISE ADVISORY CIRCULAR 120-51B TO INCLUDE SPECIFIC GUIDANCE ON METHODS TO EFFECTIVELY TRAIN PILOTS TO RECOGNIZE CUES THAT INDICATE THAT THEY HAVE NOT OBTAINED SITUATIONAL AWARENESS & PROVIDE EFFECTIVE MEASURES TO OBTAIN THAT AWARENESS. PENDING PUBLICATION OF AN UPDATED AC, A-96-106 IS CLASSIFIED "OPEN--ACCEPTABLE RESPONSE."

Recommendation Report

Monday, May 18, 2009

Log Number 2482

Issue Date 2/3/1994

U.S. AIR CARRIER OPERATIONS ARE EXTREMELY SAFE, AND THE ACCIDENT RATE HAS DECLINED IN RECENT YEARS. HOWEVER, AMONG THE WIDE ARRAY OF FACTORS CITED BY THE NATIONAL TRANSPORTATION SAFETY BOARD AS CAUSAL OR CONTRIBUTING TO AIRPLANE ACCIDENTS, ACTIONS OR INACTIONS BY THE FLIGHTCREW HAVE BEEN CITED IN THE MAJORITY OF FATAL AIR CARRIER ACCIDENTS. RECOGNIZING THAT DEFICIENCIES IN VARIOUS ASPECTS OF THE AVIATION SYSTEM MAY UNDERLIE THE ERRORS MADE BY FLIGHTCREWS, THE SAFETY BOARD CONDUCTED A STUDY TO LEARN MORE ABOUT FLIGHTCREW PERFORMANCE BY EVALUATING THE CHARACTERISTICS OF THE OPERATING ENVIRONMENT, THE FLIGHTCREWS AND ERRORS MADE IN MAJOR ACCIDENTS OF U.S. AIR CARRIERS.

Recommendation #	Overall Status	Priority
A-94-001	CAA	CLASS II

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: APPLY THE RESULTS OF RESEARCH CONDUCTED TO DATE ON THE DESIGN AND USE OF CHECKLISTS TO IMPROVE THE ERROR-TOLERANCE OF AIR CARRIER CHECKLIST PROCEDURES FOR TAXI OPERATIONS, BY ENHANCING FLIGHTCREW MONITORING/CHALLENGING OF CHECKLIST EXECUTION, PROVIDING CUES FOR INITIATING CHECKLISTS, AND CONSIDERING TECHNOLOGICAL OR PROCEDURAL METHODS TO MINIMIZE THE OMISSION OF ANY ITEMS ON A CHECKLIST. PROVIDE SPECIFIC GUIDANCE TO AIR CARRIERS FOR IMPLEMENTING THESE PROCEDURES.

FAA	Closed - Acceptable Action	2/18/1997

4/26/1994	Addressee	THE FAA AGREES WITH THIS RECOMMENDATION & IS ISSUING AN ADVISORY CIRCULAR TO ADDRESS THE BOARD'S CONCERNS. PRESENTLY, ORDER 8400.10, AIR TRANSPORTATION OPERATIONS INSPECTOR'S HANDBOOK, CONTAINS EXTENSIVE GUIDANCE ON THE SUBJECT OF CHECKLISTS. THIS GUIDANCE IS BASED ON THE RESULTS OF VARIOUS STUDIES & RESEARCH & IS AVAILABLE TO ALL AIR CARRIERS. THE FAA HAS ALSO DEVELOPED & ISSUED SUBSTANTIVE GUIDANCE ON CRM THAT WILL BE USEFUL TO AIR CARRIERS IN THE DEVELOPMENT & USE OF AIRCREW CHECKLISTS...
7/6/1994	NTSB	THE BOARD IS PLEASED THAT THE FAA PLANS TO ISSUE AN ADVISORY CIRCULAR THAT ADDRESSES THE BOARD'S CONCERNS. PENDING THE BOARD'S RECEIPT & REVIEW OF THIS AC, A-94-1 IS CLASSIFIED "OPEN--ACCEPTABLE RESPONSE."
12/18/1996	Addressee	IN A DECEMBER 18, 1996, LETTER THE FAA RESPONDED TO THE BOARD DETAILING ACTIONS TAKEN TO ADDRESS A-94-001. THE FAA'S ACTIONS INCLUDED: (1) MANDATING CRM TRAINING FOR CERTIFICATE HOLDERS REQUIRED TO COMPLY WITH 14 CFR PART 121 TRAINING REQUIREMENTS (2) REVISING ADVISORY CIRCULAR 120-51B "CREW RESOURCE MANAGEMENT TRAINING" TO ADDRESS TRAINING IN CHALLENGING ERRORS INVOLVING INADEQUATELY COMPLETING CHECKLISTS & TO PROVIDE CLARIFYING CRM GUIDANCE IN RESPECT TO CHECKLIST PROCEDURES, (3) ISSUING FLIGHT STANDARDS INFO BULLETIN 95-20, WHICH INSTRUCTS POIS OF 14 CFR PART 121 & 135 CARRIERS TO REEMPHASIZE THE NEED TO STRICTLY COMPLY WITH STANDARD OPERATING PROCEDURES & IN-FLIGHT CHECKLIST PROCEDURES, & (4) ISSUING A REPORT IN JANUARY 1995 ENTITLED "HUMAN PERFORMANCE CONSIDERATIONS IN THE USE & DESIGN OF AIRCRAFT CHECKLISTS," WHICH SUMMARIZES CONTEMPORARY HUMAN FACTORS PRINCIPLES AFFECTING THE DESIGN & USE OF ALL AIRCRAFT CHECKLISTS, NOT ONLY TAXI CHECKLISTS AS STATED IN A-94-001. THE REPORT ALSO PROVIDES GUIDANCE ON CHECKLIST DESIGN.

Recommendation Report

Friday, May 15, 2009
REC:A-03-053

Log Number 2900
Issue Date 12/2/2003 Eveleth MN 10/25/2002

On October 25, 2002, about 1022 central daylight time, a Raytheon (Beechcraft) King Air A100, N41BE, operated by Aviation Charter, Inc., crashed while the flight crew was attempting to execute the VOR approach to runway 27 at Eveleth-Virginia Municipal Airport, Eveleth, Minnesota. The crash site was located about 1.8 nautical miles southeast of the approach end of runway 27. The two pilots and six passengers were killed, and the airplane was destroyed by impact forces and a postcrash fire. The airplane was being operated under the provisions of 14 Code of Federal Regulations (CFR) Part 135 as an on-demand passenger charter flight. Instrument meteorological conditions prevailed for the flight, which operated on an instrument flight rules flight plan.

Recommendation # A-03-053

Overall Status: OAA
Priority

The National Transportation Safety Board makes the following recommendation to the Federal Aviation Administration: Convene a panel of aircraft design, aviation operations, and aviation human factors specialists, including representatives from the National Aeronautics and Space Administration, to determine whether a requirement for the installation of low-airspeed alert systems in airplanes engaged in commercial operations under 14 Code of Federal Regulations Parts 121 and 135 would be feasible, and submit a report of the panel's findings.

FAA	Open - Acceptable Response

4/12/2004 Addressee

Letter Mail Controlled 4/12/2004 12:32:06 PM MC# 2040165 The FAA shares the Board's concern regarding flightcrew awareness of low airspeed situations. As noted in the Board's letter dated December 2, 2003, failure to maintain adequate airspeed can result in unsafe circumstances like loss of control, impact with terrain or water, hard landings, and tail strikes. The Board further states that it has investigated numerous accidents and incidents involving commercial flightcrews that inadvertently failed to maintain airspeed. For example, the Board has investigated at least 11 events since 1982 involving 14 CFR Part 135 flights and at least seven events involving 14 CFR Part 121 flights in which stall or failure to maintain airspeed during approach or landing phases was cited as a causal or contributing factor and in which icing was not cited as a factor.

Current rules require stall warning (stick shaker or natural buffet) for both small airplanes and transport airplanes. The Board acknowledges the existing requirements for stall warning, but challenges the premise that stall warnings and flightcrew vigilance provide adequate low airspeed awareness. The Board states that a low airspeed alert, which would be activated at some airspeed higher than stall warning, would provide additional protection against low airspeed conditions that may lead to stall. The Board noted the existing installation of a low airspeed alert in the Embraer 120. The FAA required this alert as an interim solution until Embraer redesigns the stall warning system to account for icing conditions adequately.

Many current transport airplanes include additional cues on airspeed indicators. These cues are intended to provide improved low airspeed awareness. While not alerts, these color-coded symbols indicate the low airspeed region (the maneuver margin, typically at about 1.3 Vstall) in which the airplane is approaching the stall warning speed. As noted by the Board, such displays are now becoming available for use in less sophisticated general aviation airplanes.

Additionally, the Board has recognized that there are unresolved technical, operational, and human factors issues that will need to be carefully evaluated and addressed in connection with the design and implementation of a low airspeed alert system.

On January 21,2004, the Board provided the FAA with more complete information on the 18 accidents cited by the Board to support these safety recommendations. The FAA will include a review of these 18 accidents in determining what action needs to be taken to address the safety issue. The FAA will also consider efforts already accomplished or in progress under the Safer Skies programs and other initiatives dealing with airspeed awareness.

I will keep the Board informed of the FAA's progress on these safety recommendations.

Recommendation Report

Monday, May 18, 2009

Log Number 0392

Issue Date 8/28/1972 NEW HAVEN CT 6/7/1971

ALLEGHENY AIRLINES, INC., ALLISON PROP JET CONVAIR 340/440, N5832, OPERATING AS ALLEGHENY FLIGHT 485, CRASHED DURING AN APPROACH TO THE TWEED-NEW HAVEN AIRPORT, AT 0949 E.D.T., ON JUNE 7, 1971. TWENTY- EIGHT PASSENGERS AND TWO CREWMEMBERS WERE FATALLY INJURED. TWO PASSENGERS AND THE FIRST OFFICER SURVIVED. THE AIRPLANE WAS DESTROYED. THE FLIGHT, OPERATING BETWEEN WASHINGTON, D.C., AND NEWPORT NEWS, VIRGINIA, WITH STOPS AT GROTON AND NEW HAVEN, CONNECTICUT, AND PHILADELPHIA, PENNSYLVANIA, WAS MAKING A NONPRECISION INSTRUMENT APPROACH AND STRUCK COTTAGES AT AN ALTITUDE OF 29 FEET M.S.L., 4,699 FEET FROM THE THRESHOLD AND 510 FEET TO THE RIGHT OF THE EXTENDED CENTER-LINE OF RUNWAY 2.

Recommendation # A-72-140 **Overall Status** CAA **Priority**

THAT THE AIR LINE PILOTS ASSOCIATION AND THE ALLIED PILOTS ASSOCIATION IMPLEMENT A PROGRAM WITHIN EXISTING PROFESSIONAL STANDARDS COMMITTEES TO PROVIDE AN EXPEDITIOUS MEANS FOR PEER GROUP MONITORING AND DISCIPLINING THE VERY SMALL GROUP OF AIR CARRIER PILOTS WHO MAY DISPLAY ANY UNPROFESSIONAL (INCLUDING HAZARDOUS) TRAITS AS EXEMPLIFIED BY THIS ACCIDENT.

FAA	Closed - Acceptable Action	2/20/1975

9/14/1972 Addressee INADEQUATE ACTION INITIALLY, BUT SUBSEQUENT ACCIDENTS PRECIPITATED NEW RECOMMENDATIONS TO FAA.

Recommendation Report

Monday, May 18, 2009

MODE:AVIATION ISSUE DATE:1/1/2008 - 12/31/2008 KEYWORD 1:fatigue

Log Number 3010

Issue Date 6/12/2008 Kirksville MO 10/19/2004

On October 19, 2004, about 1937 central daylight time, a BAE Systems BAE-J3201, Corporate Airlines flight 5966, struck trees on final approach and crashed short of the airport in Kirksville, Missouri. Both pilots and 11 passengers were killed, and 2 passengers received serious injuries. The pilots had been executing a nonprecision approach at night in instrument conditions at the end of a 14.5-hour-long duty day for which they reported to duty early and during which they had conducted five previous landings in poor visibility. The National Transportation Safety Board determined that the probable cause of the accident was the pilots' failure to follow established procedures and properly conduct the approach and to adhere to established division of duties. The Safety Board also determined that the pilots' fatigue likely contributed to their degraded performance.

Recommendation # A-08-044 **Overall Status** OAA **Priority** CLASS II

The National Transportation Safety Board recommends that the Federal Aviation Administration: Develop guidance, based on empirical and scientific evidence, for operators to establish fatigue management systems, including information about the content and implementation of these systems. (A-08-44) (This safety recommendation supersedes Safety Recommendation A-06-11)

FAA	Open - Acceptable Response

8/11/2008 Addressee Letter Mail Controlled 8/22/2008 8:34:53 AM MC# 2080510: Robert A. Sturgell, Acting Administrator, FAA, 8/11/08 The Federal Aviation Administration hosted an international symposium on the subject of fatigue in aviation operations June 17 through 19, 2008. The purpose of the symposium was to gather and make public the best available knowledge on fatigue and fatigue mitigations. Staff members from the Board were key presenters at the symposium and Vice Chairman Sumwalt was a keynote speaker. The Board's contribution to the symposium was a direct and valuable part of its overall success.

This symposium was part of an overall "systems" approach that the FAA is taking regarding fatigue in aviation operations. We agree with the safety intent of these recommendations and seek to educate the industry on the reality of fatigue and ways to effectively mitigate its dangers.

As part of our planned approach to fatigue we have established the following priorities:

- We are consolidating into proceedings the information derived from the fatigue symposium. We expect the proceedings of the symposium to be distributed by September 30, 2008;
- We are developing operations specification guidance for fatigue management in ultra long range (ULR) flight operations -flights greater than 16 hours in duration. This is our immediate focus since there is no existing guidance for this flight regime. We believe that lessons learned from this action likely can be applied to other flight profiles; and
- Parallel and related to the ULR fatigue management effort is a scientific data gathering effort that will collect data on fatigue aspects of ULR and other flight operations. This data effort will form the basis for improved fatigue guidance documents and will lead to standardized protocols for such data gathering. These standardized protocols will provide us with reliable tools to validate air operators' fatigue management actions and also will give solid basis for policy guidance to the industry.