



Submission to the

National Transportation Safety Board

for the

Investigation of Colgan Air Flight 3407 Accident

Bombardier Dash 8-Q400, N200WQ

Clarence Center, New York, February 12, 2009

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Executive Summary

On February 12, 2009, at approximately 2217¹, a Colgan Air Bombardier Dash 8-Q400, N200WQ, operating as Continental Connection Flight 3407, crashed approximately five nautical miles northeast of the Buffalo-Niagara International Airport during an instrument approach to runway 23. The four crewmembers and 45 passengers were fatally injured and the aircraft was destroyed by impact forces and post crash fire. There was one ground fatality. The flight, from Newark, New Jersey, to Buffalo, New York, was operating under Title 14 Code of Federal Regulations Part 121.

The probable cause of the accident was the flight crew's loss of situational awareness and failure to follow Colgan Air training and procedures, which led to a loss of control of the aircraft.

Contributing to the accident were:

1. The flight crew's failure to follow Colgan Air procedures and training regarding the proper response to a stick shaker.
2. The lack of an adequate cockpit warning system in the Q400 to warn the flight crew when a Speed Bug is set to a speed below the calculated stall warning speed.
3. The lack of an adequate warning in the Q400 Aircraft Flight Manual or Aircraft Operating Manual regarding the effect of setting a non-ice reference speed with the REF SPEEDS switch set to INCR during approach and landing.
4. The flight crew's non-pertinent conversation during the descent and approach phase, in violation of Colgan Air's training and procedures.

This submission discusses the flight crew's decisions and actions, the flight crew's stall avoidance and recovery training, the Q400's ice protection and stall warning systems, and Colgan Air's policies and procedures regarding winter operations, pilot hiring, sterile cockpit, fatigue, and commuting. This submission also addresses Colgan Air's safety programs, pilot checking, and pilot training.

I. Factual Information

1.1. History of Flight

Captain Marvin Renslow and First Officer Rebecca Shaw were scheduled to report for duty at the company's base at EWR on February 12, 2009, at 1330. See Operations Group Chairman Factual Report, p. 2. The first two flights of the day, planned as a round

¹ Unless otherwise specified, all times set forth herein are Eastern Standard Time.

trip returning to EWR, were cancelled due to high winds that caused numerous other cancellations at EWR that day. Id.

The Sabre Crew Trac Pairing Print Report for Flight 3407 showed a scheduled departure time for Flight 3407 of 1945 and a scheduled arrival time of 2221. See Operations Group Chairman Factual Report, p. 3. The company dispatch release for Flight 3407, which was issued at 1800, showed an estimated time of departure of 1910 and an estimated time enroute of 53 minutes. Id. A Departure Clearance Request was made at 1930 and an OUT (pushback from the gate) report was made at 1945. Id. The aircraft for Flight 3407 was a Colgan Air Bombardier Dash 8-Q400, N200WQ. Id.

EWR Ground Control gave the flight taxi instructions at 2030, and EWR Tower cleared the flight for takeoff at 2118. See Operations Group Chairman Factual Report, p. 3. The ACARS report showed the flight OFF (airborne) at 2119. Id. The flight's dispatch release showed an intended route of flight from EWR to COATE intersection, then via airway V-126 to LHY, direct ULW, direct BENE, then airway V-164 to BUF. Id. The intended cruise altitude was 16,000' MSL. Id. According to FAA records, the flight was cleared by New York Center to maintain 16,000' MSL at 2131. Id. During the climb to 16,000 feet, all of the de-ice systems (propeller deice, pitot deice, and airframe deice equipment) were selected on and remained on throughout the flight. Id. The REF SPEEDS switch was set to INCR. See NTSB Public Hearing Transcript, p. 14.

The last reported weather at BUF prior to the accident was the Automatic Terminal Information Service (ATIS) broadcast at 2154 EST. See Operations Group Chairman Factual Report, p. 3. The broadcast included the following information: wind 250 degrees at 15 knots gusting to 22 knots, visibility 3 miles in light snow and mist, with few clouds at 1,100', ceiling 2,100' broken clouds, 2,700 overcast, temperature 1, dew point -1, altimeter 29.79. Id.

The ILS Runway 23 approach was in use at the time of the accident. See Operations Group Chairman Factual Report, p. 3. The Decision Altitude (DA) for the ILS Runway 23 approach is 928' MSL (200' height above touchdown) and the minimum required visibility is ½ statute mile. Id.

At 2157, Cleveland Center cleared the flight to cross BENE intersection at 11,000' MSL. See Cockpit Voice Recorder Group Chairman Factual Report Addendum, p. 12-43. At 2203, Cleveland Center instructed the flight to change to Buffalo Approach Control. Id. at 12-49. At 2203, Buffalo Approach Control advised that Buffalo altimeter was 29.80 and to plan an ILS approach for runway 23. Id. The flight crew confirmed the instructions and Captain Renslow briefed the approach at 2204. Id. at 12-50.

At 2210, the first officer asked if there was ice on the windshield. See Cockpit Voice Recorder Group Chairman Factual Report Addendum, p. 12-56. The captain responded that he had ice on his side, and asked "You don't have yours?" Id. The first officer replied "Oh yeah oh it's lots of ice." Id. The captain said "Oh yeah that's the most I've seen – most ice I've seen on the leading edges in a long time, in a while anyway I should say." Id.

Buffalo Approach Control cleared the flight direct to TRAVA intersection and gave it a series of intermediate descent clearances, the last of which, at 2212, was to 2,300' MSL. See Operation Group Chairman Factual Report, p. 3. According to ATC radar records, the flight crew intercepted the final approach course from the left. Id. Preliminary Flight Data Recorder (FDR) data show that at 2215:12 the crew extended the flaps from zero to 5 degrees. Id. At the time, the indicated airspeed was 172 kts., the autopilot was engaged and pitch trim was three degrees nose up. Id.

At 2215:14, Buffalo Approach Control transmitted, "Colgan thirty four zero seven three miles from KLUMP turn left heading two six zero maintain two thousand three hundred til established localizer clear ILS approach runway two three." See Operations Group Chairman Factual Report, p. 4. The flight acknowledged that clearance. Id.

At 2216:02, when the airspeed was over 180 kts, preliminary FDR data showed the engine power levers were reduced to at or near idle and both engines' torque values declined to minimum thrust. See Operations Group Chairman Factual Report, p. 4. The reduced power levers correspond to a sound heard on the CVR at 2215:59 similar to a decrease in engine power. See Cockpit Voice Recorder Group Chairman Factual Report Addendum, p. 12-62.

At 2216:07, Buffalo transmitted, "Colgan thirty four zero seven contact tower one two zero point five have a good night." Id. At 2216:09, the crew extended the landing gear and the auto flight system captured the ILS 23 localizer. See Operations Group Chairman Factual Report, p. 4. Three seconds later the crew moved the engine condition levers forward to the 100% torque position, and at the same time, the crew radioed "Over to tower you do the same thirty four zero seven." See Cockpit Voice Recorder Group Chairman Factual Report Addendum, p. 12-62. At this time, airspeed had slowed to just over 160 kts.

At 2216:23, the captain called for flaps 15 and the Before Landing Checklist. See Cockpit Voice Recorder Group Chairman Factual Report Addendum, p. 12-62. At this time, airspeed was about 140 kts. See FDR Group Chairman Factual Report, p. 10-9. At 2216:24, either the left or right probes detected ice on the airframe, and three seconds later the flaps were moved to 10 degrees, the stall warning stick shaker activated, and the autopilot disconnected. Id. at 10-10, 10-14. The airspeed was 130 kts. Id. at 10-14. At this point, the captain pulled back on the yoke. Id. at 10-10. Less than two seconds following stick shaker activation, the control column went from 2 to 6 degrees, and the aircraft began to increase pitch at a rate of about 2.5 degrees per second (reaching a maximum of 30 degrees 6-7 seconds after stick shaker activation). Id.

At 2216:31, the CVR recorded a sound similar to an increase in engine power. At 2216:34, the captain said "Jesus Christ." See Cockpit Voice Recorder Group Chairman Factual Report Addendum, p. 12-63. The crew added power to approximately 75% torque, and the captain again pulled back on the yoke, increasing control column pitch from 1.1 degrees to 7 degrees in less than one second. See Operations Group Chairman Factual

Report, p. 4. The airplane experienced a left roll, followed by a right roll, during which the stick pusher activated. Id. During this time, the indicated airspeed continued to decrease to less than 100 kts. Id.

Eight seconds after the flaps had been selected to 10 degrees, and at an airspeed of less than 110 knots, the flaps began to retract. At 2216:37, the first officer said "I put the flaps up." See Cockpit Voice Recorder Group Chairman Factual Report Addendum, p. 12-63. Sixteen seconds later the flaps were fully retracted. At 2216:45, the first officer asked if she should put the gear up. Id.

Following further pitch and roll excursions, the airplane pitched down and entered a steep descent from which it did not recover. See Operations Group Chairman Factual Report, p. 4.

1.2 Damage to Aircraft

The aircraft was totally destroyed due to impact forces and post-accident fire. The following statement is taken from the NTSB Structures Field Notes:

The airplane was severely fragmented and a significant post crash fire destroyed most of the airplane and house. About 60% of the main structural components of the airplane were conclusively identified. Numerous small pieces of the airplane were recovered but not conclusively identified. Structure from the radome and both wingtips was identified in the wreckage. The empennage was intact in the wreckage. The airplane wreckage was on a heading of about 070° magnetic.

Almost the entire forward fuselage was consumed in the post crash fire. The right, forward cargo door was recovered in the front yard of a house across the street (east) of the accident residence with impact damage but very little fire damage. A lower section of the left airstair door and the overhead cockpit emergency exit were recovered in the forward fuselage debris.

Some pieces of the cockpit and windshield post structure was recovered on the northeast side of the house. A portion of the center fuselage and attached center wing box was recovered intact on top of the wreckage pile at the northeast corner of the house with severe fire damage. The recovered fuselage had collapsed vertically downward just below the cabin windows on both the left and right sides. Almost the entire aft fuselage was recovered in the wreckage. The portion aft of the aft entry doors did not exhibit fire damage. The aft right entry door remained installed and the aft left entry door and aft cargo door were recovered in the wreckage separated from the fuselage. The empennage was intact and attached to the aft fuselage. The empennage was rolled to the right and resting on the right horizontal stabilizer tip. The horizontal stabilizers, vertical stabilizer, elevators, and rudder were all intact and exhibited only slight impact damage to the leading

edges. The APU was in the tailcone but broken from its mounts. The left wing was entirely consumed by fire except for the aileron, outboard flap and a portion of the spoiler. These items exhibited severe fire damage and were recovered upside down, and rotated 180° from the direction of impact. The left engine mount and thrust structure was recovered in the wreckage with severe fire and impact damage. A small piece of the lower outboard wing skin was also recovered in the wreckage with severe fire and impact damage. The outboard right wing impacted the garage of the adjacent house. A section of the right wing outboard leading edge was found in the garage holding up the roof. Most of the outboard right wing structure including the engine support and thrust structure was recovered forward of the ground scar at the southeast corner of the house with no fire damage but had significant impact damage. A section of the inboard right flap was recovered and identified in the basement with moderate fire damage. Six propeller blades were recovered embedded in the ground at the ground scar location. All three landing gear were recovered in the wreckage. The right main landing exhibited minor fire damage to the tires and the retract actuator was broken off in the almost fully retracted position. The RMLG uplock was in the open position. The LMLG was recovered with severe fire damage and the retract actuator was broken off in the almost fully retracted position. The LMLG uplock was not conclusively identified. The NLG was recovered with severe fire damage. No conclusive evidence of the NLG position was found. Based on the tree strikes, impact marks, and ground scars, the aircraft's pitch and roll angle at the time of impact was estimated to be approximately 30 degrees nose down and 30 degrees right wing low.

1.3 Other Damage (Ground Damage)

The following statement is taken from the NTSB Structures Field Notes:

The airplane impacted a house located at 6038 Long Street, Clarence Center, New York. The house was a two story old style farmhouse with a basement, covered front porch, and detached two-car garage. The house and two cars were destroyed by the impact and post crash fire but the garage remained intact. The garage of an adjacent house to the south was also impacted by the airplane. The airplane impacted the south side of the house near ground level and pieces of the airplane traveled through the house and ended up beyond the northeast corner of the house foundation. The south basement wall was fragmented by the impact and most of the debris was pushed towards the northeast corner of the basement. The top of the north basement wall exhibited impact damage adjacent to the location of the left engine. There was a distinct ground scar on the south side of the house about 10 feet south of the south foundation wall. The ground scar was about 15 feet long, 5 feet wide, and 3 feet deep. Two trees along the southern property boundary were impacted and the tops were sheared off. The west tree was cut about 20 feet above ground level and the east tree

was cut about 25 feet above ground level. There was some tree debris between the property boundary and the house that exhibited clean, angled cuts consistent with propeller impact.

1.4 Personnel Information

(a) Flight Crew Information

Both flight crewmembers were certificated under Colgan Air and Federal Aviation Administration (FAA) certification requirements. See Operations Group Chairman's Factual Report, pp. 4-7. According to FAA documents, there was no history of accidents, incidents, or enforcement actions against either the captain or first officer certificate numbers. See Operations Group Chairman Factual Report, pp. 6-7. They had no history of any driver's license suspensions or revocations.

Captain Renslow obtained his private pilot license in 1990 and his commercial pilot license in 2002. See Operations Group Chairman Factual Report, p. 4. He was hired by Colgan Air in September 2005, and held an airline transport pilot certificate (ATP) with type ratings in both the Saab 340 and Q400. Id.

Captain Renslow's background information is as follows:

Date of birth:	07-26-61
Date of hire with Colgan Air:	09-19-05
ATP Certificate No. 480885562 issued:	10-18-07
Airplane Multiengine Land	
Type Ratings: SF-340, Q400 (11-18-08)	
Commercial Privileges	
Airplane Single Engine Land	
Medical First Class issued: ²	08-22-08

See Operations Group Chairman Factual Report, pp.4-5; Human Performance Group Chairman Factual Report, p. 3.

Flight Times:

Total flying time:	3379
Total PIC time:	1030
Total Turbine time:	3051
Total time in type (Q400):	110.7
Total flying time last 24 hours:	0
Total flying time last 7 days:	16:09
Total flying time last 30 days:	56:11
Total flying time last 90 days:	116:02

² Limitation: "holder shall wear corrective lenses."

Initial Type Rating (Q400):	11-18-08
Completed IOE (Q400):	12-03-08
Last recurrent training:	04-19-08
Last proficiency check:	11-18-08
Last line check:	12-03-08

See Operations Group Chairman Factual Report, p. 6; Operations 2BB.

First Officer Rebecca Shaw obtained her private pilot's license in December 2003 and her commercial license in September 2005. See Operations Group Chairman Factual Report, p. 7. She was hired by Colgan Air in January 2008. Id. at 6.

Background information regarding FO Shaw is as follows:

Date of birth:	04-30-84
Date of hire with Colgan Air:	01-16-08
Q400 SIC type rating (Certificate No. 2810129) issued:	03-16-08
Commercial Pilot – Airplane Multiengine Land issued:	09-16-06
Flight Instructor – Airplane Single Engine issued:	05-12-06
Commercial Pilot- Airplane Single Engine Land issued:	09-22-05
Medical First Class issued:	01-22-08

See Operations Group Chairman Factual Report, pp. 6-7; Human Performance Group Chairman Factual Report, p. 8.

Total flying time:	2244
Total PIC time:	1251
Total Turbine:	774
Total time in type (Q400)	774
Total flying time last 24 hours:	0
Total flying time last 7 days:	15:49
Total flying time last 30 days:	57:20
Total flying time last 90 days:	163:21

SIC Q-400	03-16-08
Completed Initial Operating Experience:	03-22-08
Last recurrent training:	01-15-09
Last proficiency check:	03-16-08

See Operations Group Chairman Factual Report, pp. 6-7.

(b) Other Crew Members and Colgan Air Personnel

Flight Attendant Matilda Quintero, age 57, was hired in May 2008, and was trained and qualified to perform the duties assigned to her.

Flight Attendant Donna Prisco, age 52, was hired in May 2008, and was trained and qualified to perform the duties assigned to her.

Although he was not a crew member of the accident aircraft, an off-duty Colgan pilot, Captain Joseph Zuffoletto, was on board the aircraft in the passenger cabin at the time of the accident.

1.5 Aircraft Information

<u>Registration</u>	<u>Serial No.</u>	<u>Line No.</u>	<u>Date of Manu.</u>	<u>A/C total time</u>	<u>A/C total cycles</u>
N200WQ	4200	784	04-12-08	1819.3	1809

Type: Bombardier Dash 8-Q400 (DHC-8-402)

Minimum Crew: two (pilot, co-pilot, and two flight attendants)

The aircraft was operated and in compliance with 14 Code of the Federal Regulations (CFR) Part 121 and was in airworthy condition.

1.6 Meteorological Information

The last reported weather at BUF prior to the accident was the ATIS broadcast at 2154 EST, which stated: wind of 250 degrees at 15 knots, gusting to 22 knots, with visibility of three miles in light snow and mist, with a few clouds at 1,100', ceiling at 2,100' with broken clouds, and overcast at 2,700'. The temperature was 1 degree Celsius with a dew point of -1 degree Celsius, altimeter 29.79.

The following information was taken from the Meteorology Factual Report:

During the period of the KBUF upper air sounding or rawinsonde observation (RAOB), site number 72528, which was launched at approximately 1900 EST on February 12, 2009, a moist low-level environment with the lifted condensation level (LCL) 6 at 975-hPa or at 163 feet agl (868 feet msl), and a convective condensation level (CCL) 7 at 917-hPa or 1,757 feet agl (2,462 feet msl) was depicted. Surface temperature was 0.4 degrees C with a freezing level identified at 288 feet agl (933 feet msl). There were two frontal inversions identified at 5,703 feet msl and 10,460 feet msl with temperature remaining below freezing.

The soundings moisture profile indicated a relative humidity of 75 percent or more from the surface to 16,000 feet msl, with relative humidity greater than 90 percent from the surface to 9,500 feet msl. The precipitable water content was 0.42 inches. The sounding temperature and moisture profiles supported

precipitation in the form of snow at the surface, and supported airframe icing conditions between the surface and 16,000 feet.

The temperature inversions resulted in a Lifted Index (LI)⁸ of 11.8 and indicated a stable atmosphere and supported stratiform type clouds, including nimbostratus. The sounding wind profile indicated surface winds from 250 degrees at 20 knots gusting to 25 knots, with winds veering to the west-northwest with height through 10,000 feet. A low-level wind maximum was identified at 4,700 feet msl with winds from 297 degrees at 50 knots. The maximum wind was from 285 degrees at 73 knots at 38,700 feet, with the tropopause height at 29,172 feet. At 2,700 feet, the wind was identified from 265 degrees at 36 knots, with a temperature of -3 degrees C.

Buffalo Niagara International Airport is a level B augmentation 12 airport with eight certified weather observers and is manned 24-hours a day. The augments office is located in an office on the ground floor of the terminal building. On the evening of February 13, the weather group chairman interviewed Rick Davis, the NWS Certified Weather Observer who worked the evening shift on the night of the accident and monitored him making several observations, and reviewing the weather observation logs on the night of the accident. Mr. Davis's shift is from 1600 to 2400 daily Monday through Friday. His experience includes 9 years in the United States Air Force, with years as a weather observer and 6 years as a forecaster. He was born and raised in the Buffalo area, and has been an observer at KBUF for 8 years.

On the night of the accident Mr. Davis indicated that the present weather was light snow, which consisted of large wet snow flakes. He indicated that at 2114 EST the ASOS system visibility sensor wanted to report 2 1/2 miles in light snow, but he could see the visibility markers at 3 miles and edited the system accordingly. He also edited the sky condition report at 2154 and 2249 EST based on his observation of the cloud coverage. The most significant event was at 0012 EST as he was briefing his relief and the ASOS issued a report of light freezing rain, Mr. Davis was not able to stop the issuance of the report and issued a correction immediately afterwards. Mr. Davis indicated that the large wet snow was still occurring and temperatures at the surface were above freezing, and that no mixed precipitation or icing was being observed. The same problem was also noted at Niagara Falls Airport (KIAG). The problem was thought to be in the software logic of the system. I viewed the observation logs and in fact a correction was noted, but it is not reflected in the observations in sections 2.0.1 and 2.0.2 of this report. The sensor issue will be addressed to NWS Headquarters. Mr. Davis also indicated the ASOS cannot detect freezing drizzle or ice pellets, and other mixed freezing precipitation in automated mode.

TAMDAR (Tropospheric Aircraft Meteorological Data Reports) are automated weather reports from commercial aircraft. These data are transmitted from the participating aircraft via ACARS.

Two TAMDAR equipped aircraft reported icing between approximately 4,500 feet and 10,000 feet around the time of the accident. Figure 11 shows tracks of TAMDAR aircraft between 2100 EST (0200Z) and 2359 EST (0459Z). The two flight tracks to/from Buffalo both show icing (designated as red). Note that there is one TAMDAR flight flying well above Buffalo (from SE to NW) that is not reporting icing, but that plane was above the icing layer at around 16,000 feet. On the left is aircraft designated as #9392 that departed KBUF for KIAD at approximately 2137 EST (0237Z) or about 45 minutes prior to the accident. On the right is an aircraft designated as #9374 that operated from Washington Dulles International Airport (KIAD) to Buffalo (KBUF) arriving into KBUF approximately 2325 EST (0425Z) or approximately an hour after the accident.

Figure 12 shows the raw data obtained from aircraft #9392 during its ascent from KBUF. Shortly after departure at 2139 EST (0239Z), the aircraft encountered icing at 6,000 feet with an air temperature of -8.5 degrees C and remained in icing conditions through 11,940 feet. The winds at 6,000 feet were from 304 degrees at 38 knots and at 11,940 feet, the aircraft reported winds from 309 degrees at 40 knots.

Figure 14 shows the raw data obtained from aircraft #9374 during its flight from KIAD to KBUF with an arrival time of approximately 2325 EST (0425Z). At 2313 EST (0413Z) at 8,830 feet, the aircraft encountered icing conditions continuing through 4,590 feet. Winds at 8,830 feet were from 304 degrees at 37 knots while at 4,590 feet they were reported from 289 degrees at 42 knots. From 4,070 feet to 3,180 feet, the aircraft did not report icing conditions. The aircraft re-entered icing conditions at 3,120 feet and remained in icing through 2,360 feet. The aircraft only reported winds at the top of this icing level from 285 degrees at 37 knots. From 2,000 feet msl until the final data point, this aircraft did not report icing conditions.

The Current Icing Product (CIP) is a supplementary weather product that provides a graphical view of the current icing environment. Input from weather sensors is provided to software models to produce this automatically generated graphical weather product. The CIP is updated hourly, and provides current information via icing severity graphics and icing probability graphics. CIP products are not forecasts, but presentations of current conditions at the time of the analysis. CIP is not to be used as a forecast for icing conditions.

Figure 16 shows the CIP valid at 2200 EST (0300Z) for 3,000 feet msl. The chart indicates a greater than 80 percent chance of encountering icing at

3000 feet over much of western New York State. Figure 17 shows the CIP for the same period at 5,000 feet msl. This chart indicates a 70 to 80 percent chance of encountering icing at 5000 feet over the Buffalo area. Figure 18 shows the CIP for 7,000 feet msl. This chart indicates a 60 to 80 percent chance of encountering icing at 7,000 feet msl over the Buffalo area.

Aerodata observed that the flight which followed the accident flight 30 minutes later put in an "ICING" remark when they were just outside the marker on approach. See Operations Group Chairman Factual Report, Addendum 3, Attachment 5, p. 2.

1.7 Aids to Navigation

BUF Runway 23 has an FAA-certified ILS precision approach procedure that was fully operational at the time of the accident. All aids to navigation for BUF were operative at the time of the accident.

1.8 Communications

VHF communications were in use by the accident aircraft. All communication equipment for N200WQ, and ATC facilities for the route of flight, were fully operational on the day of the accident.

1.9 Flight Recorders

On February 13, 2009, the Safety Board's Vehicle Recorder Division received the following FDR:

Recorder Manufacturer/Model: Honeywell SSFDR, Model 980-4700, 128 Word
Recorder Serial Number: 14241

The recorder was in good condition and the data were extracted normally from the recorder.

1.10 History of Colgan Air, Inc.³

Colgan Air, Inc. is a regional airline headquartered in Manassas, Virginia. It operates as Continental Connection, United Express and US Airways Express. Colgan Air offers more than 350 daily flights to 53 cities in 15 states and Canada. Colgan Air operates 34 Saab 340 and 14 Q400 regional airliners, and has hub operations in Boston, Houston, Newark, and northern Virginia. Colgan Air has approximately 1,300 employees.

Colgan Air, Inc. was founded in 1991 and has gradually expanded its operations

³ This information may be found on page 25 of the Operations Group Chairman Factual Report.

over the years. In 1991, it began operating a flight with Beechcraft 1990C equipment between Washington Dulles International Airport and Binghamton, New York under the name National Capital. This route was later dropped and the name Colgan Air adapted.

On July 1, 1997, Colgan Air began operating Continental Connection flights through a marketing alliance-code share agreement with Continental Airlines. On December 11, 1999, Colgan Air started operating under a code-share and service agreement as a US Airways Express Carrier. Colgan Air reintroduced Continental Connection service in March 2005 and acquired additional Saab 340 aircraft out of Houston. On October 4, 2005, Colgan Air started providing flights for United Express flights out of Washington's Dulles International Airport.

On January 17, 2007, Colgan Air was acquired by Pinnacle Airlines Corp., the parent company of Pinnacle Airlines, Inc., a regional airline doing business as Northwest Airlink. On February 2, 2007, Continental Airlines, Inc., Colgan Air and Pinnacle Airlines Corp. entered into a Capacity Purchase Agreement, which included code-share provisions, allowing Colgan Air-operated Q400 aircraft to do business as Continental Connection. On February 5, 2007, it was announced that Colgan Air would provide service for Continental Airlines, as Continental Connection, out of Newark Liberty International Airport starting in early 2008. Colgan acquired 15 Bombardier Q400 aircraft for that service as per the Capacity Purchase Agreement.

1.11 Organizational and Management Information

The organizational and management structure of Colgan Air pertinent to the issues set forth herein is as follows:

The Vice President-Flight Operations is the executive manager in charge of operations. Reporting to him are the Director-Inflight, Director-Flight Standards, Director-Crewmember and Dispatcher Training, Director-System Operations Control and Scheduling, Director-Flight Operations, and Director-Crewmember Resources. See Operations Group Chairman Factual Report, p. 26.

Reporting to the Director-Flight Standards are the Manager-Inflight Standards, the Manager-Flight Standards, the Saab Fleet Manager, the Q400 Fleet Manager, and the APDs and Check Airmen. See Operations Group Chairman Factual Report, p. 26

Reporting to the Director-Crewmember and Dispatcher Training are the Manager-Crewmember and Dispatcher Training, the Manager-Inflight Training, and a clerk and an assistant. See Operations Group Chairman Factual Report, p. 27

Reporting to the Director-Operations is the Chief Pilot, who supervises regional chief pilots in EWR and IAH.⁴ See Operations Group Chairman Factual Report, p. 27.

⁴ Subsequent to the accident, a regional chief pilot was added in IAD.

1.12 Flight Schedule of Flight Crew

After finishing a trip on February 5, Captain Renslow had the next five days off work.⁵ On February 9, 2009, Captain Renslow spent the day at home in the Tampa area. He departed Tampa that afternoon at 1713 and arrived in EWR at about 2005. At 2247, he made a 6 ½ minute phone call. In post-accident interviews, the first officer who flew with him the next day stated the captain spent the night of February 9 in the EWR crew room.

On February 10, Captain Renslow began a two day trip. The report time was 0530. The trip ended at BUF at 1259. The duty day was 7:49 (hh:mm) which included 4:36 of flight time. Captain Renslow had the rest of the day off. According to the first officer who was flying with Captain Renslow that day, they spent the afternoon and evening relaxing at the hotel. The first officer last saw Captain Renslow about 2100-2130 as they left the pool-community area of the hotel to go to their rooms. Phone records indicate the captain made a 30 minute call at 2102.

On February 11, the first officer reported seeing Captain Renslow in the hotel breakfast area at approximately 0500. After an almost 17 hour rest period, Captain Renslow began his duty day at 0615. His duty day was 9:49, which included five hours of flight time. His last flight on February 11 arrived at EWR at 1544. During post-accident interviews, the first officer said Captain Renslow had told him he was going back to his apartment that evening. The first officer characterized the flights on February 10 and 11 as unremarkable. The first officer stated the captain's health appeared very good and the captain was well rested and alert during the trip.

After his last flight on February 11, Captain Renslow did not fly again until the accident flight, over 27 hours later. On February 11, Captain Renslow placed or received calls between 1552 and 1637, 1823 to 1829, and 2020 to 2142. Crew Trac logon records indicate that he had multiple logons from 1610 to 1640, 1759 to 1831, and 2059 to 2110, that were coded under "access crew menu" and "self notify."⁶ The last logon occurred at 2151.

On February 12, at 0310, Captain Renslow logged onto the CrewTrac system, accessed the crew menu and acknowledged a revision to the accident trip's schedule which showed a report time of 1330 and Flight 3407's scheduled 1910 departure and 2048 arrival at BUF. Captain Renslow logged on again at 0726, and used his phone several times between 1000 and 1100. Between 1200-1400, he volunteered to perform some office work for the regional chief pilot at the EWR base operations office. Later in the afternoon, he was observed in the EWR crew room watching TV and talking to other pilots. At 1624, he made a call and at 1649 he received a call. Other calls were made in the early evening hours before the accident flight.

⁵ Information in this section regarding Captain Renslow was taken from the Human Performance Group Chairman Factual Report, pp. 6-7.

⁶ The access crew menu code indicates when a pilot logs onto the computer system to review schedules. The self notify code indicates the pilot is acknowledging a change in a trip.

First Officer Shaw had four days off duty preceding the accident flight.⁷ Her last flight prior to the accident flight ended in EWR at 1455 on February 8, 2009. On February 9, 2009, telephone records indicate outbound SMS messages were sent between 2152 and 2218 PST.

According to her husband, FO Shaw awoke at home in Washington on February 10, 2009, between 0900-1000 PST. At 0926 PST, she placed a call lasting about five minutes, followed by several calls between 0931-0949 PST. She later went skiing in the Seattle area, returning home that afternoon. The evening was spent at home watching TV with her husband, who stated she went to sleep between 2000-2200 PST. At 2020 PST, she made a three minute call; and at 2214 PST she sent a SMS message.

FO Shaw's husband stated that she awoke on February 11, 2009, between 0900-1000 PST. At 0948 PST, she logged on to the CrewTrac system. At 1025 PST, a call was made to a number associated with FedEx jumpseat reservations. First Officer Shaw's husband said she had reserved a jumpseat on a flight scheduled to depart SEA about 1900 PST, and she had to be at the airport one hour before departure. He drove FO Shaw to the airport (SEA) and, after stopping near the airport to eat, arrived about 1730 PST.

FO Shaw traveled from SEA to MEM on FedEx Flight 1223. According to the captain of the flight, the flight departed about 43 minutes late. When the other passenger, a FedEx pilot, learned that the flight was not departing on time, he asked the first officer if the delay would affect her plans to get to EWR. She informed him she had a direct Continental Airlines flight as a backup.

FO Shaw and the passenger rode in the cabin. During the first hour of the flight they talked about aviation and her career, and then he observed that the first officer went to sleep "solidly" for an hour and a half. The passenger said the lights in the back were dimmed.

The flight arrived at MEM about 2330 PST. The crew and the two passengers rode the bus to the air operations center and the other passenger took the first officer to the jumpseat lounge to check-in. At 2356 PST, FO Shaw received a call on her cell phone that lasted three minutes. Between 2355-0040 PST, she sent eight text messages and received four.

On February 12, FO Shaw traveled from MEM to EWR on FedEx Flight 1514. The flight departed MEM about 0418 EST⁸ and arrived at EWR about 0623 EST. The first officer rode in the cabin. After the flight landed, she told the captain she had slept the entire flight.

⁷ Information in this section was taken from the Human Performance Group Chairman Factual Report, pp. 10-13, and Human Performance Group Chairman Factual Report, Addendum 1, pp. 3-6.

⁸ The remainder of the times set forth in this section are in Eastern Standard Time.

At 0651, FO Shaw logged onto the CrewTrac system and acknowledged changes to the trip sequence. Another crew who had a 0655 report time and 0754 departure observed the first officer standing with the accident captain in the crew room. At 0729, phone records indicate a SMS message was sent. At 0732, the first officer made a 2-minute call to a number associated with Colgan Air operations.

At 0829,⁹ the first officer sent the following text to her husband - "So I made it to Newark just fine and the weather is so [expletive] they cancelled my flights! I just go to Buffalo tonight at 730! I'm going to sleep I'll call when I'm up." A first officer reported seeing both pilots sleeping in the morning. A captain reported observing both pilots asleep around noon. A flight attendant reported the first officer sleeping in the late morning/early afternoon. After she awoke, the first officer sent the following text to her husband - "I feel soooo good, I took a nice 6 hour nap on the comfy recliner!" (According to text messages transcribed by Troy Shaw, this message was sent at 1405.)

Phone records indicate SMS message activity for FO Shaw at 1305-1312, 1355, and 1416-1424.

According to phone records, FO Shaw placed a call to her husband at 1425. Mr. Shaw confirmed that he spoke with her sometime in the afternoon between 1400-1500, and recalled that she sounded great and was just waiting to get on the airplane for Flight 3407. At 1459, the first officer logged onto the CrewTrac system to read messages. SMS message activity for FO Shaw occurred at 1514, 1522-1534, and 1611-1612. At 1625, she logged on to CrewTrac to access the crew menu. Further SMS message activity occurred at 1635, 1646-1647, 1659, and 1723.

At 1726, FO Shaw received a call, and at 1747 and 1851 she placed calls. A first officer whose flight arrived about 1853 saw both Captain Renslow and FO Shaw walking down the jet bridge to the accident aircraft as he was exiting the airplane.

1.13 Captain Renslow's Checking and Training Prior to Joining Colgan Air

On October 1, 1991, Captain Renslow was disapproved for his initial instrument airplane flight rating. See Operations Group Chairman Factual Report, p. 5. The aircraft was a PA-28-181 and the tasks disapproved were Pilot Operation 3 Task A and B; Pilot Operation 2, Task C; Partial Panel VOR Approach, NDB Approach and Holding. Id. He completed the rating on October 25, 1991. Id. This disapproval was disclosed by Captain Renslow on his employment application with Colgan Air. See Human Performance Group Chairman Factual Report, p. 3.

Captain Renslow trained at Gulfstream International Airlines prior to joining Colgan Air.¹⁰ Some of this training is summarized below.

⁹ According to the time stamp on text messages transcribed by Troy Shaw (0529 PST).

¹⁰ This training was disclosed in post-accident interviews conducted by the NTSB. See Operations Group Chairman Factual Report, Addendum 3. Captain Renslow's training records were not disclosed to Colgan

On October 22, 1998, Captain Renslow underwent a line check. See Operations Group Chairman Factual Report, Addendum 3, Attachment 1. He received satisfactory ratings for the following inflight items: communication procedures, navigation, smoothness, and cockpit organization. Id. He also received satisfactory ratings for judgment, compliance with FARs and SOPs, descent planning, approach briefing and crew coordination, and approach procedures. Id. There were no unsats in this check, however, the check airman noted that Captain Renslow was a little behind the aircraft during approaches, and needed to work on callouts on approach. Id.

On May 2, 2001, Captain Renslow received a satisfactory rating on the following inflight maneuvers: approaches to stalls – landing configuration, approaches to stalls – takeoff configuration, and approaches to stalls – clean configuration. See Operations Group Chairman Factual Report, Addendum 3, Attachment 1. On instrument procedures, he also received a satisfactory for an approach briefing. Id.

On September 19, 2001, Captain Renslow received an unsatisfactory on the following maneuvers: approach to stall – landing configuration, and two engine ILS approach procedures. See Operations Group Chairman Factual Report, Addendum 3, Attachment 1. He received satisfactory ratings on approach to stall – clean configuration, approach to stall – takeoff configuration, and two engine ILS with flight director. Id. In the normal system operations portion, he received satisfactory ratings on anti-icing and deicing and stall warning/overspeed devices. Id. Regarding abnormal system operations, he received satisfactory ratings for stall warning heat vane failure and surface deice failure. Id. He also received satisfactorily for judgment, situation awareness, crew coordination, and use of company procedures, profile, checklists. Id. For SIM period 3, he had glideslope deviations and was outside of altitude parameters. Id. In SIM session 4, the entire approach was unstable, and his airspeed was well below Vref during zero flap landing. Id. It was noted that he was often deviating from altitude. Id. In SIM session 6, Captain Renslow showed improvement maintaining aircraft attitude but was still deviating from altitude too often. Id. In SIM 7, his airspeed was more than 10 kts. below Vref +10. Id. The examiner wrote “Fly correct airspeed!” Id. In SIM 8, the examiner noted constant deviations up to full scale on glideslope, ½ to ¾ scale localizer. Id.

Captain Renslow’s training records were not at all unusual in regards to his progression. See Operations Group Chairman Factual Report, Addendum 3, Attachment 1. The difficulty with stalls in sim 3 and 4 was corrected. Id. He performed at least three afterward that were satisfactory. Id.

On May 14, 2002, Captain Renslow was disapproved for his initial commercial single engine land airplane flight certificate. See Operations Group Chairman Factual Report, p. 5. The aircraft was a C-177-RG and the tasks disapproved were takeoffs, landings, go-arounds, and performance maneuvers. Id. He completed the flight check for

Air when Captain Renslow was hired because Gulfstream did not employ Captain Renslow as a pilot, and thus the records were not covered by the Pilot Records Improvement Act (PRIA).

the certificate on June 25, 2002. Id. This disapproval was not disclosed by Captain Renslow on his employment application with Colgan Air.

Once Captain Renslow had completed his training at Gulfstream and 250 hours of contracted flight time, he was not retained because Gulfstream did not need the manpower. See Operations Group Chairman Factual Report, Addendum 1, p. 5. Gulfstream noted, however, that Captain Renslow's performance was above average. Id. at 6. In Summer 2007, Captain Renslow asked about coming back to Gulfstream, but did not pursue it. Id. He would have been hired based on his record. Id.

On April 9, 2004, Captain Renslow was disapproved for his initial commercial multiengine land airplane flight certificate. See Operations Group Chairman Factual Report, p. 5. The aircraft was a PA-44-180. Id. He was notified that the entire flight portion of the practical exam would need to be re-accomplished. Id. He completed the flight check for the certificate on April 29, 2004. Id. This disapproval was not disclosed to Colgan Air.

1.14 FO Shaw's Checking and Training Prior to Joining Colgan Air

FO Shaw trained at the KLM Flight Academy. See Operations Group Chairman Factual Report, Addendum 3, Attachment 3. While at KLM, according to its Training Manager, she performed 600-1000 stall recovery procedures. Id. On Jan. 23, 2007, she performed stall recoveries from a full stall in a clean configuration, approach to stall in clean configuration, approach to stall in approach configuration, and approach to stall in landing configuration.

The KLM AOM (PA28-181) section on cruise/descent (Dec. 1, 2006) instructed that to recover from a stall in clean configuration, the pilot should maintain the pitch attitude, apply full power and right rudder, and not allow the nose of the aircraft to rise as a result of the increased power. See Operations Group Chairman Factual Report, Addendum 3, Attachment 3. Also, the pilot should ensure the flaps are up, check power, and accelerate without altitude loss. Id.

The version of the KLM AOM (PA28-181) dated November 1, 2004, stated that to recover from a stall in a clean configuration, the pilot should bring the nose under the horizon, apply full power and right rudder without allowing the nose to rise. See Operations Group Chairman Factual Report, Addendum 3, Attachment 3. It also instructed that once the aircraft is un-stalled, the nose should be raised to initial climb attitude, and the pilot should climb back to the initial altitude. Id. Safe recovery prevails over altitude loss, which should be minimized. Id. Flaps are checked up, power checked, and the aircraft levels off. Id.

1.15 Colgan Air Hiring Process¹¹

Colgan Air pilots undergo a rigorous, multi-tiered evaluation process before they are hired. In fact, about two-thirds of those who are initially contacted for an interview are not offered a job. See Operations 2H, Interview of Vice President of Administration Mary Finnigan, p. 46.

The process starts with an online application through Airline Apps. See Operations Group Chairman Factual Report, p. 27. This application process covers flight time, accidents, incidents, violations, DUIs, failed checkrides, and other items bearing on the fitness of a pilot applicant. Id. Applicants who appear well qualified are contacted for a phone interview involving in-depth inquiries of the items covered by the online application and the pilot's general flying background and qualifications. Id. Applicants who successfully pass the phone interviews are invited for an in-person interview. Id.

At the in-person interview, the applicant takes a 50 question written test that parallels the FAA's Airline Transport Pilot written exam. Id. Those who pass the written exam undergo an interview conducted by a pilot recruiter or the Manager of Recruiting and qualified line pilots. Id. Applicants who pass this phase of the interview process are evaluated by a check airman in a full motion simulator. Id. This full motion simulator evaluation is not required under Federal Airline Regulations.

Pilots who successfully complete all steps in this process become training candidates. Id. As a training candidate, the pilot must pass all ground training, simulator training, checkrides, and PRIA (Pilot Records Improvement Act) records and background checks prior to commencing their initial operating experience. Id.

Colgan Air's internal hiring guideline at the time of the accident was 600 total hours with 100 hours of multi-engine time. Id. This guideline was not a rigid requirement; Colgan Air evaluates the total pilot and recognizes that certain experience is more valuable. Id. at 28.

1.16 Pilot Records Improvement Act of 1996 (PRIA)

All Part 121 air carriers are required to comply with the Pilot Records Improvement Act of 1996 (PRIA). PRIA provides that before a pilot may begin service with an air carrier, the hiring air carrier must request and receive certain information regarding the applicant pilot. The information includes records from the FAA, other air carriers (or other entities that employ pilots), and the National Driver Register. The records that must be provided by the FAA are: 1) current airman certificates with associated type ratings and limitations; 2) current airman medical certificate including any limitations; and 3) summaries of FAA legal enforcement actions resulting in a finding by the Administrator of a violation that was not subsequently overturned.

¹¹ The hiring process detailed herein is set forth in the Operations Group Chairman Factual Report, pp. 27-28.

Under PRIA, the records that must be provided by air carriers are any records that pertain to the pilot that are maintained under 14 CFR Part 121 (except records which do not pertain to the individual's performance as a pilot), such as proficiency and route checks, training, and releases from employment. The reporting period is five years – records over five years must not be provided unless the information concerns a revocation or suspension of an airman certificate or motor vehicle license and the revocation or suspension is in effect on the date of the request.

1.17 Freedom of Information Act (FOIA)

The Advisory Circular regarding the Pilot Records Improvement Act (PRIA) in effect at the time Captain Renslow was hired on September 19, 2005, was AC 120-68C, issued on January 28, 2004. See Exhibit A, attached hereto. This Advisory Circular did not contain any reference to an air carrier obtaining Notices of Disapproval through FOIA, nor did it set forth any procedures in effect at the FAA for FOIA requests. Id. In fact, the Advisory Circular did not reference FOIA at all. Id.

On November 7, 2007, AC 120-68D was issued and included the following new language:

NOTE: a request with a signed consent by the pilot/applicant may be used to authorize the FAA to release records of Notices of Disapproval for flight checks for certificates and ratings to an air carrier making such a request. Air carrier representatives involved in the pre-employment screening process may find this additional information helpful in evaluating the pilot/applicant. These requests, however, are not an integral part of the standard PRIA request process. Consult the PRIA program manager for details.

AC 120-68D, ¶ 3-8(a)(3). This FAA Advisory Circular was not in effect at the time Colgan Air hired Captain Renslow, who had been hired over two years before the Advisory Circular was issued by the FAA. In fact, at the time AC 120-68D was issued, there was no published guidance on requesting Airman Notices of Disapproval from the FAA. No such requests were made by air carriers between the issuance of the Advisory Circular and the time of the accident, nor were there established procedures in place at the FAA for handling such requests.

1.18 Hiring History of Captain Renslow

After Captain Renslow successfully completed Colgan Air's hiring process detailed in Section 1.16, above, he was hired on September 19, 2005. See Operations Group Chairman Factual Report, p. 4. His online application was accepted through Airline Apps, he passed the phone and in-person interviews, he passed his simulator check, and the PRIA and background check did not reveal any disqualifying information. See NTSB Public Hearing Transcript, pp. 311-15; 347-48. After the accident, however, Colgan Air

learned that Captain Renslow was not truthful on his employment application. See NTSB Public Hearing Transcript, pp. 347-48.

Colgan Air's employment application contains the following question: "Have you ever failed any proficiency check, FAA check ride, IOE or line check?" See Human Performance Group Chairman Factual Report, p. 3. In response, Captain Renslow answered, "Yes", and provided the following explanation, "FAA check ride for instrument rating. Id. I missed the NDB approach, received additional instruction, then repeated the approach and passed." Id.

Captain Renslow, however, had two other FAA certificate disapprovals he failed to disclose. See NTSB Public Hearing Transcript, pp. 347-48. He was initially disapproved for both his initial commercial single engine land airplane flight certificate (May 14, 2002) and his initial commercial multiengine land airplane flight certificate (April 9, 2004). See Operations Group Chairman Factual Report, p. 5.

Colgan Air followed PRIA and the guidance published by the FAA on obtaining pilot records, but was unable to receive this information, because Captain Renslow was not employed as a pilot at the time of these failures, and thus PRIA did not cover the disapprovals. Id. As discussed above, at the time of Captain Renslow's hiring, the FAA had not notified air carriers of any options under FOIA to receive additional information, and the FAA did not develop procedures for handling such requests until after the accident. Id.

1.19 Hiring History of FO Shaw

Like Captain Renslow, FO Shaw successfully completed Colgan Air's hiring process detailed in Section 1.16, above. She was hired by Colgan Air on January 16, 2008. See Operations Group Chairman Factual Report, p. 6. Her online application was accepted through Airline Apps, she passed the phone and in-person interviews, passed the simulator check, and the PRIA and background check did not reveal any disqualifying information.

FO Shaw had one FAA certificate disapproval, which she disclosed prior to being hired by Colgan Air. See Operations Group Chairman Factual Report, p. 7; NTSB Public Hearing Transcript, p. 349. The disapproval was for an initial flight instructor certificate, which she subsequently obtained. See Operations Group Chairman Factual Report, p. 7

1.20 Colgan Air Q400 Training Program

Training for the initial cadre of Colgan Air Q400 pilots was provided by FlightSafety Canada pursuant to the Purchase Agreement between Bombardier Inc. and Pinnacle Airlines Corp. See Operations Group Chairman Factual Report, p. 40. Colgan Air's Q400 training program, which was essentially the FlightSafety generic training program with added enhancements pertinent to Colgan's operations, was approved by the FAA in August 2007. See NTSB Public Hearing Transcript, pp. 228-230. Colgan Air's training

program was used for the training of the initial cadre of Q400 pilots, although all training courses and simulator sessions were taught by FlightSafety instructors using FlightSafety simulators. By September 2008, Colgan Air was teaching ground training, although FlightSafety simulators were still being used.

Colgan Air's training uses state-of the-art equipment such as a full-motion simulator, a flight management system trainer, and a ground flight simulator. See NTSB Public Hearing Transcript, p. 158.

Captain Renslow obtained his training under Colgan Air's FAA approved program, using Colgan Air instructors and Flight Safety International's simulator in St. Louis, Missouri. See NTSB Public Hearing Transcript, p. 228. He completed his ground training at Colgan Air's facilities in Manassas, Virginia. Id.

First Officer Shaw's training was done by Flight Safety, and her checking was done by approved Flight Safety personnel.¹² See NTSB Public Hearing Transcript, p. 230.

Colgan Air's basic indoctrination training lasts 40 hours. See Exhibit B, Crew Member and Dispatcher Training Program Manual, p. 4A-1, attached hereto. This course includes company policies and procedures, applicable provisions of the FARs, meteorological training, and other items. Id. at 4A1-4A5. In addition to basic indoctrination training, pilots undergo CRM training and winter operations training. Id. at 4A-61, 4A-64-4A69. The students then undergo 80 hours of systems training. Id. at 4A-33. At the completion of systems training, they take a written exam. Id. Before beginning simulator training, each student on the Q400 has to complete an online FMS training course, as well as three CPT Sessions. See NTSB Public Hearing Transcript, p. 261; Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009, p. 6. These CPT Sessions use a ground training device to go over flows, abnormal procedures, and use of automation. If they pass the written exam, they move on to seven simulator sessions, one checkride (the check ride will be a type ride in most cases if pilot is captain) and one Line Oriented Flight Training (LOFT) session (real time trip using simulator without interaction by instructor). See NTSB Public Hearing Transcript, pp. 209-10. The time in the simulator is about 14 days, so a new hire at this point would have undergone about six weeks of training. Id. at 247-48.

After satisfactorily completing all required training, including an FAA regulatory check ride, a pilot must satisfy the operating experience requirements of FAR Part 121, before being considered fully qualified for revenue service. The pilot must fly with an FAA-approved check airman for all OE (Operating Experience) flights. See NTSB Public Hearing Transcript, pp. 210. FAA regulations require 20 hours of OE, and permit a 50% reduction in all OE hours for each landing. For example, by regulation, a pilot with 11

¹²Under OpSpec A031, Colgan Air is authorized to make arrangements with specified training centers listed in order to conduct instruction and/or evaluations. See Operations Group Chairman Factual Report, p. 33. The Part 142 Training Centers that are permitted to conduct Initial, Transition, and Upgrade Training are Flight Safety International at St. Louis, MO, Seattle, WA, and Ontario, Canada. Id. at 33.

hours and 10 landings could complete OE. At Colgan Air, a pilot must complete the full 20 hours, regardless of the number of landings.

Also, although there is no FAA requirement to do so, Colgan Air requires pilots to observe four flights from the jumpseat prior to OE. See Statement of Dan Morgan, Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, p. 6. Colgan Air OE hours range from 20 hours to 50 hours depending on the pilot training course (i.e., new hire, transition, or upgrade).

After completing the OE, the pilot must pass a line check before operating as a fully qualified crew member. See NTSB Public Hearing Transcript, p. 210.

Colgan Air's pilots also undergo recurrent training once a year. See NTSB Public Hearing Transcript, p. 192. The ground portion of the recurrent training lasts at least three days. Id. at 248. In addition, captains receive a simulator proficiency check twice a year and first officers once a year. Id. at 192. These simulator sessions last four hours.

1.21 Captain Renslow's Checking and Training at Colgan Air

As a result of the training program set forth in Section 1.20 above, Captain Renslow had over 120 hours of Q400 training, four observation flights with experienced Q400 pilots, over 20 hours flying with a check airman observing him, and two successful check rides.

The Colgan Air Crew Member and Dispatcher Training Program Manual sets out details of performance standards on page 2-2 and the following pages. It reads as follows:

Flight crewmembers will be required to receive a satisfactory grade on all flight maneuvers, procedures and duties. A satisfactory grade is obtained ONLY when the student demonstrates the ability to operate the aircraft/simulator in the manner that shows he/she is obviously the master of the aircraft, and with successful outcome of each maneuver never in doubt on a scale of 1 through 4, as indicated below in the Simulator Grading Legend:

Flight/Simulator Training Grading Legend:

1. Trainee understands maneuver and completes it successfully. No further training is necessary.
2. Trainee understands maneuver and completes it successfully. Further training for retention is necessary.
3. Trainee understands maneuver but is unable to complete the maneuver with the degree of accuracy necessary for flight check purposes. Further training is necessary and will be considered unsatisfactory performance.
4. Trainee does not understand maneuver and is unable to complete it successfully. He/she needs further instruction and explanation prior to

further flight or simulator training and will be considered unsatisfactory performance.

Additionally, all maneuvers must be accomplished in accordance with the applicable completion standards as set forth in this program. Unsatisfactory grades indicate the requirement of additional training. The standards set forth in the ATP Practical Test Standard as revised are the completion standards for all Proficiency Checks.

See Operations Group Chairman Factual Report, pp. 33-34.

The pilot must be removed from line operations until he/she satisfactorily completes the training or check. See Exhibit B, Crew Member and Dispatcher Training Program Manual, p. 2-3.

In the event the pilot requires additional training following a proficiency check and the pilot is then found to be proficient, the check airman must document the items originally failed and generate a training form for the training conducted. The check airman may then certify the pilot's proficiency as satisfactory if all maneuvers and procedures are performed satisfactorily. See Operations Group Chairman Factual Report, p. 35. In order to maintain objectivity, checking and evaluations are not be performed by the same individual who conducted the training. Id. Also, checking and evaluations are performed without interference or influence from company management. Id.

On October 28, 2005, Captain Renslow was graded as TP (train to proficiency) on his initial proficiency check in the SF-340 as First Officer. See Operations 2BB. The task area identified was normal/abnormal procedures. Id. The grade identifies that one or more check items needed to be repeated, but that the overall performance was satisfactory. Id.

On October 17, 2006, Captain Renslow received an unsatisfactory grade on his Recurrent Proficiency Training event at Colgan Air in the SF-340. Id. At the time, Captain Renslow was a first officer. Id. The unsatisfactory tasks were rejected takeoffs, general judgment, landings from a circling approach, oral exam, and non-precision approach. Id. According to company records, he attended recurrent training, and then completed requalification proficiency training on November 1, 2006. Id.

On October 14, 2007, Captain Renslow received upgrade LOFT and sim training in the Saab 340. Id. On October 15, 2007, Captain Renslow was disapproved for his initial airline transport pilot certificate. Id. The aircraft was a Saab SF-340 and the task disapproved was approach and landing with powerplant failure – multiengine airplane. Id.

After Captain Renslow failed his initial type certification on the Saab 340, the Director of Training informed the Chief Pilot of the failure. See Operations Group Chairman Factual Report, Addendum 3, Attachment 6. The upgrade proficiency check

was performed by a FAA Aircrew Program Designee. Id. The Chief Pilot spoke with the examiner and ascertained that Captain Renslow did not meet the standards for the single-engine missed approach procedure. Id. The instructor retrained Captain Renslow on the single-engine missed approach procedure, and had him conduct single engine approaches, go-arounds without the use of the autopilot, and single engine approaches without use of the flight director. Id. Captain Renslow met the standards, and the instructor signed him off for his checkride. Id. After this retraining, Captain Renslow was retested and completed his upgrade proficiency check and received his Airline Transport Pilot certificate.¹³ The upgrade proficiency check was performed by a FAA Aircrew Program Designee. Id.

Captain Renslow also completed Colgan Air's Captain Upgrade Curriculum, including an eight hour course on captain's duties and responsibilities. See Human Performance Group Chairman Factual Report, p. 15. The intent of the course is to help the captain transition roles. Id. The course focuses on the captain's duties, CRM, and situational awareness. Id. at 15-16. Although Colgan Air requires its upgrading captains to complete this course, it is not required for FAA Pilot-in-Command (PIC) qualification, and the FAA does not mandate captain leadership training. Id. at 16.

As Chief Pilot, Mr. Honan was head of the Pilot Upgrade Review Board at Colgan Air. See Operations Group Chairman Factual Report, Addendum 3, Attachment 6. In this capacity, he reviewed the training records and interviewed crewmembers who were getting ready to upgrade or transition. Id. When Captain Renslow put in a bid to transition to the Q400, Chief Pilot Bill Honan spoke with Captain Renslow about the transition. Id. Mr. Honan reviewed Captain Renslow's training records and noted he had three successful checking events since his initial failure for his type certificate on the Saab 340. Id. Mr. Honan informed Captain Renslow that he would have to successfully complete a proficiency check prior to transition. Id. Captain Renslow passed the check and was entered in the next transition class. Id. Captain Renslow successfully transitioned to the Q400 and passed his DHC-8 Type Rating. Id.

From the time Captain Renslow successfully completed his Saab 340 upgrade proficiency check, until the time of the accident, he did not fail a single checking or training event. See Operations 2BB. He passed an upgrade line check performed by a Colgan Air checkairman on October 31, 2007, an upgrade operating experience observed by the FAA on October 31, 2007, a recurrent line check performed by a checkairman on September 26, 2008, a transition PC/type check given by an FAA Aircrew Program Designee (APD) on November 18, 2008, and a transition line check administered by a checkairman on December 3, 2008. Id.

Captain Renslow also successfully completed recurrent proficiency training on April 19, 2008, transition ground school on October 31, 2008, and transition simulator training on November 17, 2008. See Operations 2BB.

¹³ Due to a clerical error, Colgan Air's records reflect that Captain Renslow completed his upgrade proficiency check on October 15, whereas FAA records reflect that the ATP rating was received on October 18.

The following reflects the successful checking/training events following Captain Renslow's failed October 2007 Saab 340 captain upgrade check:

Training Events

Retrained (Loft/Upgrade Sim/Add'l Sim) ¹⁴	10-14-07/10-15-07
Recurrent Proficiency Training	04-19-08
Q400 Transition Ground School	10-31-08
Q400 Transition Sim Training	11-17-08

Checking Events

Captain Upgrade PC ¹⁵ (APD)	10-15-07
Captain Upgrade Line Check (checkairman)	10-31-07
Captain Upgrade Operating Experience (observed by FAA)	10-31-07
Captain Recurrent Line Check (checkairman)	09-26-08
Q400 Transition PC/Type Check (APD)	11-18-08
Q400 Transition Line Check (checkairman)	12-03-08

See Operations 2BB.

At the time of the accident, Captain Renslow had 3,379 total hours of flight experience and was Airline Transport Pilot rated, which is the highest level of pilot certification available. See Operations Group Chairman Factual Report, p. 6; Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009, p. 5. He held a "type certificate" in the Q400 issued by the FAA. He had 172 hours of formal training on the Q400 aircraft, qualifying him fully in accordance with all applicable Federal Aviation Regulations.

1.22 FO Shaw's Checking and Training at Colgan Air

FO Shaw did not fail any checking events at Colgan Air. See Operations 2BB. She successfully completed her initial simulator training in March 2008, and passed her initial proficiency check in March 2008. Id. She passed initial winter operations training on January 28, 2008, and recurrent winter operations training on January 15, 2009. Id.

At the time of the accident, FO Shaw had 2,244 total hours of flight experience, with 774 hours in the Q400. See Operations Group Chairman Factual Report, p. 7.

¹⁴ The records of Colgan Air with respect to the dates of this retraining do not match the FAA's dates.

¹⁵ FAA records reflect this occurred on October 18, 2007.

1.23 Colgan Air Stall Warning Training

All Colgan Air Q400 pilots receive training in the Q400 Stall Protection System, including the stick shaker and stick pusher functions, stall recognition, and stall recovery, in their academic training during ground school. See NTSB Public Hearing Transcript, p. 170. At the time of the accident, pilots also received hands-on stall warning, recognition and recovery training (except for stick pusher demonstration) in the Q400 simulator. See Operations Group Chairman's Factual Report, pp. 35-36; NTSB Public Hearing Transcript, p. 162.

Like all other Part 121 carriers, Colgan Air's FAA-approved training program teaches and checks "Approach to Stalls." See Operations Group Chairman Factual Report, p. 35. Pilots learn how to recognize an impending stall and how to recover from it before an actual aerodynamic wing stall occurs. See NTSB Public Hearing Transcript, p. 162. The stick shaker is designed to warn a pilot about an impending aerodynamic wing stall. Id. at 35, 50. The stick pusher activates after the stick shaker and only after the Stall Protection System has determined that an aerodynamic wing stall has occurred. Id. at 49-50. Stick pusher is not a warning function; it is a post-stall recovery tool. Id. at 50.

All Colgan Air pilots are trained to respond to a stick shaker so that an actual aerodynamic wing stall is avoided. If the crew performs the proper approach to stall recovery procedure, they will never experience an aerodynamic stall or stick pusher. Stick pusher simulator demonstration training is not a standard practice in the airline industry.

The Colgan Air DHC-8 Q400 Series Simulation Training is described in Appendix F in the Training Manual, pp. F-1 to F-13. See Operations Group Chairman Factual Report, p. 35. The training described is for Q400 initial, transition, upgrade, recurrent¹⁶ and requalification pilot simulator training. Id. Flight training events are described in detail for eight flight simulator training modules, the last of which is a check ride. Id.

The Q400 training syllabus provides instruction on "approach to stalls" in three different flight configurations – takeoff, landing, and clean. See Operations Group Chairman Factual Report, pp. 35-36. These sessions are trained in three separate four-hour modules of the simulator training course, with each pilot in the two-pilot crew encountering stall scenarios. The student will spend as much time training on these specific maneuvers as necessary to perform them at the highest level of proficiency. During their certification check ride, all students are tested on stall recognition and recovery in all three flight configurations.

Stall warning in the Q400 simulator training is conducted in lessons 1, 4 and 7 and stalls are evaluated on the proficiency check. See Operations Group Chairman Factual Report, p. 35. The following training for stalls is programmed:

¹⁶ Recurrent training (ground portion) is 3 or 3.5 days. Recurrent training (sim portion) is 8 hours that includes a four hour simulator session, an oral exam, prior briefing, and de-briefing.

Lesson One – Approach to Stall – takeoff, enroute, and landing configuration
Lesson Four – Approach to Stall – takeoff and landing configuration
Lesson Seven – Approach to Stall – landing configuration

Id. Illustrations of the three stall profiles to be flown are depicted in the CFM, section ten, revision 1, pp. 7-9. Id.

The clean stall, which refers to a stall performed with gear and flaps retracted, is entered from an airspeed of 180 kts, at a minimum altitude of 5000 feet AGL, and with power at flight idle. See Operations Group Chairman Factual Report, p. 35. The pilot flying (PF) calls out “stall,” advances power to the rating detent, and states “check power.” Id. The profile says that during the stall the PF is to maintain heading and altitude. Power should be adjusted to maintain 180 kts to exit the maneuver. Id.

The takeoff stall is entered at 180 kts, at a minimum altitude of 5000 feet AGL, with flaps set to 15 degrees, gear down, and power at flight idle. See Operations Group Chairman Factual Report, p. 35. The PF is to maintain heading and altitude during the maneuver and begin a 20 degree bank turn at 120 kts. Id. The PF calls out “stall,” advances power to the rating detent, rolls wings level, and states “check power.” Id. The PM calls out “positive rate,” the PF calls “gear up,” the PM calls “Vfri,” and the PF calls “flaps 0.” Id. Power should be adjusted to maintain 180 kts to exit the maneuver. Id. at 36.

The landing stall is entered at 180 kts, at a minimum altitude of 5000’ AGL, with flaps set to 35 degrees, gear down, and power at flight idle. See Operations Group Chairman Factual Report, p. 36. The PF is to maintain heading and altitude during the maneuver. Id. The PF calls out “stall,” advances power to the rating detent, and states “check power, flaps 15.” Id. The pilot monitoring (PM) calls out “positive rate,” the PF calls “gear up,” the PM calls “Vfri,” and the PF calls “flaps 0.” Id. Power should be adjusted to maintain 180 kts to exit the maneuver. Id.

The PTS standard is to recover from the stall with a minimal loss of altitude. See Operations Group Chairman Factual Report, pp. 36-37. During the stall recovery exercises for initial simulator training, the candidates were instructed to maintain an assigned altitude and complete the recovery procedures with minimal altitude loss.

The basic pilot proficiency check is detailed on pages 6-2 to 6-5. See Operations Group Chairman Factual Report, p. 36. Both PIC’s and SIC’s must perform approaches to stalls. Id. Regarding approaches to stalls (pp. 6-4), the manual states:

Check airmen shall evaluate the applicant’s ability to recognize and recover from an approach to stall in three separate airplane configurations. The three configurations are the clean configuration, the takeoff configuration, and the landing configuration. Check airmen may waive all but one of the stalls and the one stall must be performed while in a turn with a bank angle between 15 and 30 degrees. This waiver authority should be used when an

applicant's performance in other events indicates a high degree of proficiency.

Id.

For checkrides, the crew member prepares for the stall by setting the configurations appropriate to the stall, such as configuring the flaps, the gear, the condition levers, preparing for the stall, and announcing the area is clear before performing the stall. See NTSB Public Hearing Transcript, pp. 240-41. The stall maneuver itself requires proper company call-outs, and execution of procedure, followed by return to the flight regime. Id. The stall maneuver is done as a memory item. Id.

1.24 Flight Crew's Stall Warning Training

Captain Renslow and First Officer Shaw received the stall training that was part of Colgan Air's FAA approved training program for the Q400. See NTSB Public Hearing Transcript, pp. 161-62. Colgan Air meets all FAA requirements for stall training, and Colgan Air's stall recovery procedures follow the FAA's Practical Test Standards. See Operations Group Chairman Factual Report, p. 33. In addition, to obtain each grade of license, pilots must pass a certification check ride that includes stalls as a required maneuver (private pilot, instrument rating, commercial pilot, and multi-engine). Since stall recovery procedures are essentially the same for every aircraft – decrease the angle of attack, add power, and level the wings, the stall checking and training a pilot receives over his/her career has a cumulative effect. See NTSB Public Hearing Transcript, pp. 191, 194.

During their Q400 check rides, both Captain Renslow and First Officer Shaw were tested on stall recognition and recovery. See NTSB Public Hearing Transcript, pp. 161-62. This would have been the sixth certification event at a Part 121 airline wherein Captain Renslow would have been tested on stall recognition and recovery. See Operations 2BB; Operation Group Chairman Factual Report, Addendum 3, Attachment 1. Prior to entering a Part 121 training program, every single pilot must have shown proficiency in recovering from a stall during four certification events – private pilot, instrument rating, commercial pilot, and multi-engine rating.

Captain Renslow received stall warning checking and/or hands-on training at Colgan Air on the following occasions:

October 6, 2005	Initial Simulator Training
October 28, 2005	Initial Proficiency Check
October 17, 2006	Recurrent Training
November 1, 2006	Recurrent Training
October 3, 2007	Upgrade Proficiency Check
October 14-15, 2007	Simulator Training and Upgrade Proficiency Check
November 17, 2008	Transition Simulator Training
November 18, 2008	Transition Proficiency Check

See Operations 2BB.

FO Shaw received stall warning checking and/or training at Colgan Air on the following occasions:

March 11, 2008	Initial Simulator Training
March 16, 2008	Initial Proficiency Check

See Operations 2BB.

Captain Renslow performed at least 35 stall recovery procedures during his career at Colgan Air. Also, since the stick shaker is a first flight of the day test item, Captain Renslow felt the operation of the stick shaker each time he flew the Q400 on an origination flight. Review of company records show Captain Renslow flew the Q400 on 25 origination flights. See Spreadsheet of Captain Renslow's Originating Flights in Saab 340 and Q400, attached to December 4, 2009 letter to Lorenda Ward.

In addition to his training at Colgan Air, Captain Renslow was also trained in stall recognition and recovery at Gulfstream. For example, he received stall training in May 2001 and September 2001, which is summarized in Section 1.13, above.

The Q400 training program did not include tactile stick pusher training. Instead, pilots were taught the proper approach to stall recovery techniques in response to the stick shaker. The training ensures an actual aerodynamic stall does not occur, so the stick pusher will not fire. Colgan Air's Saab 340 training, however, did include hands-on stick pusher training.

Captain Renslow underwent stick pusher training in the Saab 340 on the following occasions:

October 6, 2005	simulator initial training
October 14-15, 2007	upgrade simulator training

See Captain Renslow's Training Record, Operations 2BB.

The syllabus for lesson one of the Saab 340 simulator training for initial, transition, and upgrade training is a four hour session that includes a demonstration of the stick shaker and stick pusher in a clean configuration, takeoff configuration, and landing configuration. See Crewmember and Dispatcher Training Program, Saab 340 B Series Syllabus. Lesson one also contains a pre-flight stall warning test that includes an activation of the stick shaker and stick pusher which provides the pilot with hands-on feedback. Id.

Captain Renslow also would have felt the operation of the stick pusher on the ground during the following training:

October 28, 2005	initial proficiency check
October 15, 2007	failed type ride
October 18, 2007	completed upgrade proficiency check and airline transport pilot certificate
April 19, 2008	recurrent proficiency training

See Captain Renslow's Training Record, Operations 2BB.

In addition, Captain Renslow would have felt the operation of the stick pusher each time he flew a Saab 340 aircraft on a first flight of the day, since a stick pusher test was one of the "first flight of the day" check items. See December 4, 2009 letter to Lorenda Ward. The test involves holding the stall one and two switches in the upper position, and confirming that: 1) the left and right stick shakers activate and "clackers" sound; 2) both PUSH 1 and PUSH 2 lights illuminate; and 3) the stick pusher activates. Id. Review of company records reveals that Captain Renslow operated the Saab 340 on its origination flight on 89 occasions. Id.

In sum, Captain Renslow had multiple training sessions on a stick pusher in the simulator, and also felt the operation of a stick pusher on almost 100 occasions. Id. This training is significant due to the similarities between the stall warning systems in the Saab 340 and the Q400. Id.

The stall warning system for the Saab 340 and the Bombardier Q400 are nearly identical in all significant ways. Id. However, the Saab 340 does not have a switch like the Q400 REF SPEEDS switch that artificially raises the stall warning activation speeds. Id. Both include a stick shaker and a stick pusher, and the components and operation of each is essentially the same. Id. Both aircraft use two independent computers that receive angle of attack signals from two transducers located on either side of the fuselage. Id. If certain thresholds are reached, the stick shaker will activate and an aural warning will be provided. Id. If the angle of attack further increases, the stick pusher is activated. Id.

Both the Saab 340 and Q400 stall warning systems have the same basic type of components, including the following: stall protection modules, stick pusher actuator, stick pusher capstan, stick pusher quadrant, a stick shaker, and angle of attack transducer. Id.

The Saab 340 stall warning system is comprised of two stall warning identification computers, two angle of attack transmitters, two stick shakers (one on each control column), an aural stall warning, a visual warning system, and a stick pusher mechanism that transfers rotation of the stick pusher servo actuator to a forward movement of the control columns. Id. The pusher applies 80 pounds of force forward on the control column to a position of 4 degrees elevator down. Id. The pusher can be overridden by approximately 90 pounds of force exerted on the control column. Id.

Similarly, the Q400's stall protection system consists of two stall protection modules. Id. Each module uses the following parameters: angle of attack, flap position, mach number, power level angle, condition level angle, and REF SPEEDS switch position.

(See Section 1.27 for more details on the REF SPEEDS switch). Id. The modules calculate when to activate the stick shaker and stick pusher. Id. When the modules operate the stick shaker, a signal to the Automatic Flight Control System disengages the autopilot. Id. If the aircraft is near a stall condition, the control columns will vibrate. Id. In addition to this tactile warning, the stick shaker motor and the rattling of the chain mechanism on the control column creates a loud noise. Id.

If the stall is not averted, the Q400's stick pusher activates and provides a 70 pound nose-down force to both control columns. Id. The stick pusher actuator turns an output pinion to move a stick pusher capstan that moves the control column forward when the aircraft is in a stall condition. Id. The stick pusher requires 80 lbs. of force to override. Id.

Due to the fact that the Saab 340's stall warning system (including the stick pusher) is nearly identical in all functional ways to that of the Q400 (except for the REF SPEEDS switch), the operation of the Q400 stick pusher would have been quite familiar to Captain Renslow.

1.25 Colgan Air/Q400 Winter Operations Procedures

The Bombardier Q400 Aeroplane Flight Manual (AFM) provides procedures for the use of the Ice Protection Panel. See Operations Group Chairman Factual Report, pp. 14-16. The AFM states the REF SPEEDS switch should be set to INCR prior to encountering icing conditions, when ice is first detected, or when the flashing "Ice Detected" advisory appears on the Engine Display. Id. at 16. This selection is to be done at the same time as the engine intake door switches, the prop selector, and the windshield heat are placed on; the pilot's side window heat switches are to be turned on if ice is forming on the pilot's side window. Id.

For climb, cruise, and descent in icing conditions (paragraph 4.7.2.3), the AFM procedure is to maintain at least minimum airspeed (climb, $V_{fto} + 20$ kts; descent $1.223 V_{sr}$ for 0 flaps + 25 kts); to operate the de-ice boots on FAST or SLOW depending on rate of accumulation (SLOW, however, can only be used during cruise flight), and to monitor wing and tail advisory lights for normal operation. See Operations 2KK. When the aircraft is aerodynamically clean, the procedure is to turn off the de-ice boots and the REF SPEEDS switch. Id. At this time, the pilot should revert to non-ice airspeed. Id. A note states "The aircraft is aerodynamically clean when all ice is removed from the visible leading edges and wing tips." Id.

For holding, approach and landing in icing conditions (paragraph 4.7.2.4), minimum airspeeds in icing apply, the de-ice boots must be operated in FAST, and a performance penalty must be applied. Id. There is a note which states, "When holding in icing conditions flaps must be at 0 degrees." Id. Minimum airspeeds for operating in icing conditions are as follows:

-Minimum holding, 190 kt.

- Approach Speed $1.23 V_{SR}$ (Figure 5 – 1 – 2) flap $0^\circ + 25$ kt.
- Approach Speed (Figure 5 – 8 – 1) flap $5^\circ + 20$ kt.
- Go-around Speed (Figure 5 – 8 – 1) flap $5^\circ + 20$ kt.
- Approach Speed (Figure 5 – 8 – 2) flap $10^\circ + 20$ kt.
- Go-around Speed (Figure 5 – 8 – 2) flap $10^\circ + 20$ kt.
- Approach Speed (Figure 5 – 8 – 3) flap $15^\circ + 20$ kt.
- Go-around Speed (Figure 5 – 8 – 3) flap $15^\circ + 20$ kt.
- Landing V_{REF} (Figure 5 – 8 – 1) flap $10^\circ + 20$ kt.
- Landing V_{REF} (Figure 5 – 8 – 2) flap $15^\circ + 20$ kt.
- Landing V_{REF} (Figure 5 – 8 – 3) flap $35^\circ + 15$ kt.

Id.

When the aircraft is no longer in icing conditions (paragraph 4.7.2.5), the procedure is to continue the use of de-ice boots on “fast” until all ice is removed from the visible leading edges. See Operations Group Chairman Factual Report, p. 16. Once the aircraft is aerodynamically clean, the procedure is to turn the de-ice boots and the REF SPEEDS switch off and resume normal airspeeds. Id.

The Colgan Air CFM, section 2, Limitations, states under paragraph 2.6.6, Ice Protection:

Engine: Engine intake by-pass doors must be open for engine operation in icing conditions. NOTE: Icing conditions exist when the SAT on the ground and for takeoff is 10 degrees C or below, or SAT in flight is 5 degrees C or below, and visible moisture is present in any form (such as clouds, fog with visibility of one mile or less, rain, snow, sleet or ice crystals. Icing conditions also exist when the SAT on the ground and for takeoff is 10 degrees C or below when operating on ramps, taxiways or runways where surface snow, standing water, or slush may be ingested by the engines or freeze on engines, nacelles or engine sensor probes.

Airframe: When ice is detected, the AIRFRAME MODE SELECT selector must be positioned at FAST or SLOW. See paragraph 4.7, OPERATION IN ICING CONDITIONS.

See Operations Group Chairman Factual Report, p. 16.

The Q400 Engine Display (ED) shows a message, “ICE DETECTED,” when one or both ice detector probes have detected more than 0.5 mm of ice. See Operations Group Chairman Factual Report, p. 17. This is depicted by item one of Figure 7. Id. The message will flash in yellow reverse video for five seconds, and if the REF SPEEDS switch is not set to the INCR position, the message continues in normal video. Id. When the airplane is in icing conditions with the REF SPEEDS switch set to INCR, the message is in white normal video, not flashing. Id. Item two of figure 7 depicts the “INCR REF SPEED message, which displays when the REF SPEEDS switch is set to INCR. Id.

Colgan Air's ground training curriculum includes a winter operations section specifically focused on how to handle winter weather conditions such as icing. See Operations Group Chairman Factual Report, p. 38. Winter operations training covers:

- use of holdover times;
- aircraft deicing/anti-icing procedures, checks and responsibilities;
- aircraft surface contamination, critical area identification and effect on performance and handling characteristics;
- types, purpose, characteristics, and effectiveness of deicing and anti-icing fluids;
- deicing/anti-icing fluids handling/performance implications.

See Operations Group Chairman Factual Report, p. 38.

According to Colgan Air training records, Captain Renslow completed transition winter operations anti-ice/deice training on October 31, 2008, during his transition training for the Q400. See Operations 2BB. Training records also showed that FO Shaw had last completed recurrent winter operations anti-ice/de-ice training on January 15, 2009. Id.

During winter operations training, as well as during initial and recurrent ground school, Colgan shows its pilots a video entitled "Icing for Regional & Corporate Pilots." The video discusses the latest information from NASA and the FAA about icing. The purpose of the video, as stated in its introduction, is:

- To review fundamentals of aircraft icing
- To enhance the pilot's ability to assess hazardous icing conditions
- To enhance the pilot's understanding of icing effects on stability and control of the aircraft
- To present strategies that pilots can use to exit a hazardous icing encounter
- To discuss super cooled large droplets

See Operations Group Chairman Factual Report, p. 38.

Initial ground school winter operations training is a two hour course; recurrent is one hour. See Colgan Air Crew Member and Dispatcher Training Program Manual, p. 4A-64. In the simulator for new hires, upgrade, and transition, the pilot will receive three to six hours of exposure to icing conditions, failure of de-icing equipment, etc. Use of icing equipment is also covered in recurrent proficiency checks and in the oral exam of the proficiency check.

Colgan pilots also receive training regarding deicing procedures and operation of deicing equipment when they undergo aircraft-specific training.

1.26 Q400 Airspeed Indication, Speed Bug and Low Speed Cue

The primary airspeed indications are on the left and right Primary Flight Displays (PFD). The Q400 AOM Section 12.12 describes the aircraft airspeed indication systems. See Operations Group Chairman Factual Report, Figure 9, p. 20. Indicated airspeed is displayed on the upper left side of the instrument. Id. The vertical scale shows the aircraft's current indicated airspeed as a rolling drum indication with marks every ten knots. Id. The tape displays +/- 42 KIAS around the actual aircraft speed. Id. A digital display shows the IAS from 30 KIAS up to 500 KIAS. Id. The number seven (7) shows the current airspeed. Id. The hollow triangle is the desired (bugged) airspeed, and the low speed cue is depicted by the number five (5). Id. The vertical bar below the low speed cue is red. Id. When IAS is less than or equal to the low speed cue, the digital IAS displays changes to red. Id. The low speed cue is computed by the Stall Protection System and provides indication of minimum operating speeds. Id.

1.27 The Q400 Reference Speeds Switch

The Q400 has a reference speeds (REF SPEEDS) switch that the pilot sets to INCR when operating in icing conditions. According to the Bombardier AOM, when the REF SPEEDS switch is set to INCR, the stall firing angle of the stick shaker and the stick pusher is set to a relatively lower angle of attack, which means that the Stall Protection System changes its calculations because of the reduced performance limitations of the aircraft in icing conditions. This has the effect of increasing the speed at which the stall warning system (i.e., the stick shaker and stick pusher) will activate, providing the same stall warning margins whether or not operating in icing conditions.

When the REF SPEEDS switch is set to INCR, the Engine Display (ED) of the Electronic Instrument System (EIS) shows a white INCR REF SPEED message. No red or amber Warning or Caution lights are illuminated when the REF SPEEDS switch is set to INCR. The Q400 is the first variation of the Dash 8 that incorporates the use of the REF SPEEDS switch to achieve the required stall warning margin for icing operations.

In order to maintain the same margin between stall warning activation (stick shaker) and actual stall speed for operations in icing conditions, when the REF SPEEDS switch is set to INCR, the flight crew is required to add an additional 15, 20, or 25 kts to the normal Vref speed depending on the expected landing flap setting. Assuming a flaps 15 landing with the REF SPEEDS switch set to INCR, the AFM and AOM require that the Vref speed must be increased by 20 kts. There are no "Cautions" or "Warnings" in the AFM or AOM that setting a Speed Bug to a non-icing Vref speed with the REF SPEEDS switch set to INCR could result in stick shaker activation at a speed greater than Vref. However, there is a "Caution" in the AFM and AOM in the "Take-Off In or Into Icing Conditions" that states "If airspeed is

not increased before the REF SPEED switch is set to INCR, stall warning may occur.” There is nothing to prevent a pilot from inputting a Speed Bug speed that is below the Stall Warning System’s calculated stick shaker activation speed. Further, there is no active warning to a pilot that a bug speed has been set below the calculated stick shaker speed or Low Speed Cue.

Eight days after the accident, Colgan Air issued an Operations Bulletin which reinforced the operation and use of the REF SPEEDS switch and included the following warnings and cautions:

CAUTION:

If airspeed is within 20 Knots of the Low Speed Cue, the airspeed must be increased before REF SPEEDS switch is selected to INCR or a stall warning may occur.

CAUTION:

If Vref [not Vref (ICE)] is used for landing, the REF SPEEDS switch must be selected to OFF or a stall warning may occur at a speed higher than Vref.

See Operations 2LL.

On March 18, 2009, Colgan Air issued Operations Bulletin Q400 CFM #09-003, which added a REF SPEEDS switch item to the Normal Checklist. See Operations 2MM. The position of the REF SPEEDS switch is to be checked by the crew after the Approach & Landing Brief is completed and before the speed bugs are set. The bulletin also states as follows:

The decision to turn the REF SPEEDS switch to INCR or OFF, for an approach, should be made prior to entering the initial approach phase and before the final approach segment.

It is prohibited to change the position of the REF SPEEDS Switch below 1,000’ AGL

Whenever the REF SPEEDS switch is set to INCR the only speeds which may be bugged are Vref (Ice) and Vga (Ice).

When the REF SPEEDS switch is set to OFF the speed bug may be changed to Vref and Vga if above 1000’ AGL.

Id.

In addition, the Adverse Weather section of Colgan Air’s current FAA-approved Q400 Company Flight Manual now includes the following guidance, warnings and cautions regarding the REF SPEEDS switch:

CAUTION:

If airspeed is within 20 Knots of the Low Speed Cue, the airspeed must be increased before REF SPEEDS switch is selected to INCR or a stall warning may occur.

CAUTION:

If Vref [not Vref (ICE)] is used for landing, the REF SPEEDS switch must be selected to OFF or a stall warning may occur at a speed higher than Vref.

CAUTION:

If airspeed is not increased before REF SPEEDS switch is selected to INCR, stick shaker(s) may activate.

See Exhibit C, attached hereto.

1.28 AeroData Calculations for Proper Landing Speed and Flight Crew Deviations

Colgan Air uses AeroData to provide takeoff and landing performance and weight and balance calculations. See Operations Group Chairman Factual Report, p. 14. Flight crews can request and receive real time calculations through ACARS. Id. After the crew enters required items, such as temperature, altimeter setting, runway, and airplane gross weight, the performance data is calculated and received within 10 to 30 seconds. Id. For landing data, optional keyword entries are “icing” and “eice.” Id. The system then returns a message which displays Vref, Vga, Vfri, and Vcl¹⁷, as well as maximum allowable landing weight and landing distance. Id.

The icing entry is made if the flight is in icing conditions. The eice entry is made if ice is picked up during flight and residual ice stays on the airframe even after operation of the deice boots.

Per the Bombardier AFM, the chart below shows the minimum reference speeds for icing conditions based on an estimated landing weight of 54,366 lbs. See Operations Group Chairman Factual Report, p. 8. The estimated landing weight computed in accordance with Ops Spec A099 was 54,306. Id. at 9. The landing weight entered by the crew into ACARS was 54,700. Id. at 8.

Configuration	Clean	Icing	Actual (Flight 3407)
Zero flaps	145 kts	170 kts	170 ¹⁸
Flaps 5	133 kts	153 kts.	170 down to sub-140 ¹⁹

¹⁷ Landing reference speed, go-around speed, flap retract speed, and climb speed.

¹⁸ Airspeed immediately before Flaps 5.

¹⁹ The decrease in air speed occurred over 74 seconds, but was not linear. Instead, air speed initially rose, then steadily declined from over 180 kts to under 140 kts in 26 seconds.

Flaps 10	124 kts	144 kts.	130
Flaps 15	118 kts	138 kts	n/a

See Operations Group Chairman Factual Report, pp. 10-13.

Based on the crew's Aerodata request, the Vref speed provided to the crew was 118 kts (flaps 15). See Operations Group Chairman Factual Report, p. 13. According to the CVR transcript, it appears that both flight crewmembers set 118 kts as Vref in the Speed Bug #1, despite the REF SPEEDS switch being set to INCR. At 2216, power was reduced to near flight idle and airspeed slowed from about 180 to 130 kts and the stick shaker activated about the same time the flaps were moved to ten degrees. (The stick shaker would not have activated if the REF SPEEDS switch was not set to INCR).

1.29 Colgan Air Sterile Cockpit Policy

The Colgan Air Flight Operations Policies and Procedures Manual (FOPPM) addresses standardization, cockpit decorum, sterile cockpit concept, and airplane control on pages 5-23 to 5-25. See Operations Group Chairman Factual Report, p. 28. It states, "The captain is to maintain at all times a businesslike environment in the cockpit that is conducive to the safe and proper conduct of the flight." Id. The FOPPM refers to 14 CFR 121.542, which states:

Flight crewmember duties.

(a) No certificate holder shall require, nor may any flight crewmember perform, any duties during a critical phase of flight except those duties required for the safe operation of the aircraft. Duties such as company required calls made for such nonsafety related purposes as ordering galley supplies and confirming passenger connections, announcements made to passengers promoting the air carrier or pointing out sights of interest, and filling out company payroll and related records are not required for the safe operation of the aircraft.

(b) No flight crewmember may engage in, nor may any pilot in command permit, any activity during a critical phase of flight which could distract any flight crewmember from the performance of his or her duties or which could interfere in any way with the proper conduct of those duties. Activities such as eating meals, engaging in nonessential conversations within the cockpit and nonessential communications between the cabin and cockpit crews, and reading publications not related to the proper conduct of the flight are not required for the safe operation of the aircraft.

(c) For the purpose of this section, critical phases of flight includes all ground operations involving taxi, takeoff and landing, and all other flight operations conducted below 10,000 feet, except cruise flight."

Note: Taxi is defined as “movement of an airplane under its own power on the surface of an airport.”

See Operations Group Chairman Factual Report, pp. 28-29.

1.30 Colgan Air Aviation Safety Action Program (ASAP)

Colgan Air has an ASAP program which involves its pilots, flight attendants, dispatchers, and mechanics. See Human Performance Group Chairman Factual Report, p. 20. The program was started in 2005. Id. The ASAP program coordinator manages the inflow of ASAP reports, makes sure that the ERC findings are disseminated to the appropriate personnel for corrective action, and evaluates the ASAP data to identify trends. Id. The Manager of Flight Standards, a representative from the FAA, and a pilot representative comprise the ERC. Id. Colgan Air uses an FAA contractor for the ASAP forms and to manage the database. Id. The forms used by pilots and other groups covered under ASAP are available electronically on the company’s website. Id.

About 12-15 ASAP reports are submitted each month. See NTSB Public Hearing Transcript, p. 395. The database is analyzed every quarter and they look for trends and repeating events or airport locations. See Human Performance Group Chairman Factual Report, p. 20. The ASAP coordinator compiles a quarterly report and also an annual report. Id. The quarterly reports are disseminated to management channels in flight standards and flight operations, and are posted on the company website for all employees to access. Id.

Most ASAP data involve altitude deviations, route deviations, and slight deviations from clearances. See Human Performance Group Chairman Factual Report, p. 21. Also, ASAP data revealed some issues with overspeed during the New York ATC environment. See NTSB Public Hearing Transcript, pp. 459-60. There have been no ASAP reports regarding sterile cockpit violations in the 12 months preceding the accident, and there were no pre-accident ASAP reports on stall warning activations, severe icing, or temporary loss of control of the aircraft. See Human Performance Group Chairman Factual Report, p. 21.

1.31 Colgan Air Fatigue Policy

Colgan Air has a fatigue policy covering its pilots and flight attendants. See Human Performance Group Chairman Factual Report, p. 30. The fatigue policy and steps for calling in fatigued are covered during basic indoctrination ground school. Id. Colgan Air’s fatigue policy states:

Colgan Air recognizes that there may be occasions and/or circumstances where a Crewmember’s ability to accept or complete an assignment is altered by fatigue. While our concerns are oriented to serve safe operations, we need to review all of the known factors which have led to a call of Crewmember fatigue and any resultant operations impact. This information

will facilitate the development of fatigue history and identity factors which led to fatigue. We can then evaluate fatigue and its relationship to operational considerations which may improve our planning and prevent recurrence.

Id.

When a Crewmember is unable to complete an assignment or reassignments because of fatigue, he/she must accomplish the following:

Immediately notify SOC and the Operations Duty Officer.
Complete the Crewmember Fatigue Form located on the following page.
Within 24 hours of being released from duty because of declared fatigue, FAX or deliver the completed form to the Chief Pilot or Duty Officer at [fax number redacted].

Id.

The Crewmember Fatigue Report contains entry fields for the following: name, employee number, date, local time, check-in time, local time fatigue reported to system control, block flown, time on duty today in hours and minutes, aircraft type, pairing number, bid line, reserve line yes or no, released from duty by, at what time. See Human Performance Group Chairman Factual Report, p. 30. It also contains a grid to be filled out by the crewmember listing the flight number, origination, destination, en route time, and weather, for all legs known. Id. at 30-31. Crews are asked to note legs added to the original pairing schedule. Id. at 31. The reverse side of the form contains a grid to be filled out by the crewmember listing the flight and duty time for the six days preceding the fatigue call. Id. It contains date, pairing number, bid line number, reserve yes or no, flight time, duty time, and hours rest before duty. Id.

At the time of the accident, if a pilot reported fatigued, the chief pilot would be notified by crew scheduling, and would ensure that the pilot submitted the required report. See Human Performance Group Chairman Factual Report, p. 31. Fatigue reports were submitted to crew scheduling and then forwarded to the chief pilot. Id. If it was a one time event, the chief pilot would file the report and not take further action. Id. If there were repetitive instances of calling in fatigued, the chief pilot would call to ascertain if there was a problem that needed to be addressed. Id. From May 2008 (when the chief pilot assumed that title/position) to the time of the accident, about a dozen pilots called in fatigued. Id.

The 3rd Quarter Safety Department Review included an item titled "Crew Rest Challenges" under the heading "issues and challenges." See Human Performance Group Chairman Factual Report, p. 22. It contained the following bullets: complaints to FAA, increased crew declarations of fatigue, implemented restrictions on long duty days, and pairings audited since October 1 to ensure scheduling restrictions in place with no findings. Id. The listed restrictions were: no pairings built in excess of 13 ½ hour duty day, no duty

days greater than 14 hours without duty officer approval, and no duty days in excess of 15 ½ hours without crew agreement. Id.

Colgan Air policy prohibits crew members from using a crew room to sleep overnight. A read-and-sign memo from the Newark chief pilot communicated this policy with respect to the Newark crew room and advised pilots they are responsible for their own overnight accommodations. See Read and Sign Memo 08-13 dated May 24, 2008, which reads in pertinent part as follows:

SLEEPING IN OPERATIONS

If a Crew Member is based in EWR then you are responsible for your own overnight accommodations. Sleeping in Operations or any crew room in EWR is strictly prohibited and will have severe disciplinary consequences, up to and including termination.

See Human Performance Group Chairman Factual Report, pp. 27-28.

Company records indicate that both the Captain and the First Officer acknowledged receipt of this read-and-sign memo. Id. at 27. In interviews with Colgan Air pilots, the pilots were aware of the policy against overnighting in the crew room, and none of the pilots had observed the crew room being used for overnight rest prior to going on duty. Id. at 28.

1.32 Colgan Air Pilot Scheduling

Flight time limits must not exceed 30 hours in any 7 consecutive days, 100 hours in any calendar month, or 1000 hours in any calendar year. See Human Performance Group Chairman Factual Report, p. 31. Pilots are also not scheduled for more than 8 hours flight time between required rest periods. Id. at 31-32. Pilots are required to report for duty a minimum of 60 minutes before scheduled departure time. Id. at 32. Off-duty time begins 15 minutes after block-in unless the captain notifies the company. Id. Colgan Air uses CrewTrac, a computerized system, to ensure compliance with duty and rest time regulations. See NTSB Public Hearing Transcript, p. 293.

Colgan Air's schedules are printed and published for a maximum 12 hour duty day (which would include downtime from flying). See Statement of Dan Morgan, Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009. Actual revenue operation can in some circumstances extend beyond 12 hours. Under no circumstances does the pilot's duty day exceed 16 hours. The Manager of SOC is alerted if a crew member is going to exceed a 13 ½ hour duty day.

1.33 Colgan Air Commuting Policy

The 2006 Flight Crewmember Policy Handbook, page 1-12, contained the following information regarding commuting:

While commuting by Flight Crewmembers is understood and accepted by the Company, in no way will commuting be deemed a mitigating factor in the Flight Crewmember's scheduling, punctuality and demeanor. All Flight Crewmembers will be fully accountable for their timely arrival and appearance at their base. Any and all expenses incurred because of commuting will be borne by the Flight Crewmember. Flight Crewmembers should not attempt to commute to their base on the same day they are scheduled to work.

See Human Performance Group Chairman Factual Report, p. 27.

The Employee Handbook (Page 2-4 dated February 2005) contained the following statement about commuting in the general regulations section:

Colgan Air understands it may be necessary for employees to commute, however, in no way will commuting be deemed a mitigating factor in an employee's schedule, punctuality or demeanor. All employees will be fully accountable for on time appearance at their base (for their shift). Any and all expenses incurred because of commuting will be the responsibility of the employee.

See Human Performance Group Chairman Factual Report, p. 27.

Colgan policy allows pilots relief from disciplinary action if, due to unforeseen flight schedule disruption, the pilot is unable to report to duty. See Human Performance Group Chairman Factual Report, p. 26. The pilot must show they were listed on reservations for two flights to qualify. Id. at 26. The procedure can be used twice in a 12 month time period. Id. Although Colgan Air has 420 pilots, the policy is only used about six times per month, which suggests Colgan pilots are properly managing their commuting arrangements. See NTSB Public Hearing Transcript, p. 355.

1.34 Colgan Air Sick Leave Policy

Colgan pilots earn ½ day sick leave after 90 days employment and then earn ½ day sick leave a month with a maximum carryover of 30 days. See Human Performance Group Chairman Factual Report, p. 32. The Flight Crewmember Policy Handbook cites that pilots earn 1.875 hours a month of paid sick leave with a maximum carryover of 112.5 hours. Id.

Sick calls are made to crew scheduling. A doctor's note is not required. Id. There is no follow-up for a pilot calling in sick unless it occurs on a repetitive basis. Id. Colgan pilots are always paid 75 hours guaranteed, regardless of events such as sick calls (unless the pilot has no accrued sick leave). See NTSB Hearing Transcript, p. 272.

1.35 Colgan Air CRM Training²⁰

Crew Resource Management (CRM) is presented during initial new hire indoctrination as an eight hour class and during recurrent training as a two hour class. The course addresses the relationships between crew members and the use of outside resources, like system operations, gate and ramp personnel, and maintenance. Having clear communications skills is emphasized. Sterile cockpit procedures are also discussed during this training. The course uses accident case studies to raise discussion points on the benefits of good human factors and crew interaction. Issues with automation usage are also discussed to emphasize the importance of awareness of automation systems and their modes of operation. There are team-building exercises during indoctrination. The average class size is about 12 students. Dispatchers attend classes with pilots. Prior to flight attendant training being moved to Albany, there would be occasional joint pilot-flight attendant CRM classes held in Manassas.

CRM is also evaluated and practiced during systems integration and simulator training and checking activities. CRM and effective communications are also stressed in company guidance outlining crew actions before departure, such as the captain conducting a crew briefing to set the tone for a positive working environment; and in the duties and responsibilities outlined for the captain to "actively promote and utilize CRM while on duty."

A 45-slide PowerPoint presentation was used in this training. The slides addressed the subject areas and modules outlined in the Crewmember and Dispatcher Training Program (CMDTP) manual and included command, leadership, leadership styles, expectations and standardization; team management, communication, situational awareness, decision making, and automation interface issues. One slide was titled "automation awareness" and contained the following bullets: situation awareness, automation management, mode awareness, energy state awareness, terrain awareness, and systems awareness.

An 11-slide PowerPoint presentation on situational awareness was also used during the CRM training. One slide was titled "clues to loss of situational awareness" and contained the following bullets under the heading operational clues: failure to meet targets, undocumented procedure, departure from SOP, violating minimums or limitations, not flying airplane, and not looking outside. Another slide addressing this issue contained the following bullets: communications, ambiguity, unresolved discrepancies, preoccupation or distraction, confusion or empty feeling. The slide deck ended with the introduction of the error chain and contained a slide titled "how to break the chain" which

²⁰ This material may be found beginning on page 13 of the Human Performance Group Chairman Factual Report.

included the following bullets: maintain situational awareness, checklist discipline, and standard operating procedures.

Regarding the development of monitoring skills, a ground school instructor said that the CRM class discusses situational awareness and the importance for the pilot monitoring to be observant, assertive, and communicative. The CRM class provides pilots with sufficient information to develop monitoring skills. The class includes instruction on monitoring the instruments and gauges and is something that is briefed, discussed, and performed every day. Colgan Air's Flight Operations Policies and Procedures Manual (FOPPM) contains a section outlining the use of checklists. Included in the section is the statement:

While using checklists in all aircraft, it is imperative that all pilots avoid the temptation to become so engrossed in cockpit duties that outside vigilance is reduced. Also, preliminary landing and final landing checklists shall whenever possible, be completed in sufficient time so that attention to them does not distract pilots from other critical tasks.

1.36 Colgan Air Safety Culture

Colgan Air has a robust safety culture. The company has a top down commitment to safety featuring open lines of communication and constant interaction both within the Company and between the Company and the FAA. See Human Performance Group Chairman Factual Report, p. 24. This has resulted in an excellent historical safety record. The company has operated since 1991 and has flown over 10 million passengers. See Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009, p. 2. Prior to this tragic accident, Colgan Air never had a single passenger fatality. Id.

Colgan Air has daily conference calls wherein safety is the first item on the agenda. Colgan Air also has monthly and quarterly newsletters, and quarterly Safety Review Board and Safety Council meetings to further safe operations. See Human Performance Group Chairman Factual Report, p. 17.

A representative of the Safety Department attends new hire indoctrination training to provide an overview of the company's safety programs. See Human Performance Group Chairman Factual Report, p. 17. All new-hire employees receive this orientation and are presented information about the company's safety programs, as well as how to submit safety reports, contact safety personnel, access safety information on the company website, and find safety information in the company manuals. Id.

The company holds regular meetings of senior management personnel to discuss safety. See Human Performance Group Chairman Factual Report, p. 17. These include quarterly Safety Council meetings chaired by the president/CEO of the company and attended by senior (vice president and director levels) personnel representing all company departments. Id. The purpose of the Safety Council meetings are to "[increase] safety

awareness, to raise unresolved safety issues, facilitate group discussion and develop positive outcomes.” Id. In addition to these meetings, the company also holds Safety Review Board meetings involving its middle management. Id. The company uses these vehicles, in part, to identify emerging safety trends. See NTSB Public Hearing Transcript, p. 404.

Safety is also the top item on the agenda at daily operational meetings which include Safety Department personnel. See NTSB Public Hearing Transcript, p. 404. Safety is also the first item discussed at weekly senior staff meetings. Id.

Colgan Air’s number one guiding principle outlined in its manuals is “never compromise safety.” The Employee Manual under a section titled “operational goals” states, “Safety – Our primary goal is to provide 100% safe transportation for our customers. Safety is the first priority of Colgan Air. No other value or goal has priority over safety.” The general policies and procedures section of the FOPPM begins with the statement, “In all aspects of Colgan Air operation, safety shall be given primary consideration. Each and every employee is responsible for ensuring safety in his own daily operations and shall promote safety among his fellow employees.”

The company has a Safety Program Manual outlining its safety policies and procedures, and its safety reporting programs. The manual outlines the company’s non-reprisal policy which states that disciplinary actions will not be taken against anyone immediately disclosing an occurrence involving safety. See NTSB Public Hearing Transcript, p. 458. It also outlines the safety roles and responsibilities of personnel throughout the organization including the president, vice presidents, directors, managers and supervisors, and employees.

Safety information is communicated to Colgan Air’s pilots via CrewTrac messages, read-and-sign memos, monthly newsletters, and safety bulletins. See Human Performance Group Chairman Factual Report, p. 18. In the CrewTrac computer system, in an addition to company emails and messages which must be reviewed and acknowledged before the pilot can check his/her schedule. Id. There is also a section maintained by the Safety Department on the crew website, along with a section maintained by the Flight Standards Department that has safety-related information. Id.

Colgan Air personnel can report safety issues on a 24-hour anonymous hotline. See Human Performance Group Chairman Factual Report, p. 18. This, however, is unnecessary and seldom used, since safety issues are usually raised directly. Id. Colgan Air also has multiple forms employees can use to report safety issues, such as a Feedback Reporting Form, an aircraft/equipment/facilities damage report, a cabin safety report, a disruptive passenger report, an aviation safety action program report, a personal injury form, a ground safety and hazard reporting program form, an undeclared dangerous goods discrepancy report, and an irregularity event report form. Id. at 19.

In August 2008, Colgan Air safety personnel, including the Vice President of Safety and Regulatory Compliance and the company President, traveled to all bases to conduct a

briefing to pilots and operational personnel on safety and the company's safety programs (including ASAP and LOSA). See Human Performance Group Chairman Factual Report, p. 18. A 31 slide PowerPoint presentation titled "Safety an Olympic Event" was presented in what managers described as a safety road show lasting 90-120 minutes. Id. The slides discussed expectations for safety including operating the safest airline in the industry and included one in which employees express ideas openly in a participative environment. Id. They addressed safety culture and discussed industry accidents involving organizational and management factors. Id. The slides quoted an NTSB accident report stating, "the airline's management did not instill an adequate safety orientation in its maintenance personnel by emphasizing the importance of adhering to procedures. ... Senior management created a work environment in which a string of failures became probable. Accordingly, their role must be considered causal in this accident." Id. The slides discussed methods to prevent an accident of that type, including "ensure a culture of safety exists in your company." Id. Ways to change culture by providing top down guidance that is put into practice and reinforced were also discussed. Id. Additional accidents involving chains of errors were reviewed and the summary slides at the end stated that what causes accidents is, "rarely a single event, often a failure of a common procedure, and inattention to routine tasks and complacency." Id.

Colgan Air operations also receive periodic safety audits, including Department of Defense audits, IOSA audits, and internal evaluation program audits.

Colgan Air's safety programs go above and beyond what is required by the FAA. For example, Colgan has an ASAP program, and conducts periodic Line Oriented Safety Audits (LOSA).

Colgan Air's commitment to safety led to the adoption of additional programs such as FOQA. Starting a FOQA program is expensive and time-consuming (implementing FOQA takes about a year). Nonetheless, prior to the accident, Colgan Air made a commitment to institute FOQA as part of its ongoing commitment to safety. After the last non-QAR (quick access recorder) equipped aircraft was delivered to Colgan Air on August 1, 2008, Colgan Air authorized the funding to purchase and install QAR equipment in its fleet.

Colgan Air developed an implementation and operations (I&O) plan which tracked AC-120-82 and, in October 2008, was approved by the FAA's Principal Operations Inspector for Colgan Air, as well as FAA AFS-230 (Voluntary Safety Programs Branch). As part of this process, approved airlines such as Colgan Air agree to brief, on a quarterly basis, the POI on safety trends and corrective actions.

In 2008, Colgan Air also signed a contract with a vendor for data analysis and began actively negotiating for QAR purchases. At present, Colgan Air is one of only 24 of the 101 Part 121 and/or Part 121/135 operators that have FOQA programs in place. See Interview Notes of Thomas Longridge, Operations Group Chairman Factual Report, Addendum 3.

2. ANALYSIS

2.1 The Flight Crew Did Not Respond to the Unexpected Stall Warning in Accordance with Colgan Air's Training and Prescribed Procedures

In response to the unexpected stall warning, the flight crew did not follow Colgan Air's training and prescribed procedures. Their inappropriate flight control inputs in response to the unexpected stall warning contributed to the accident.

The crew had set a Speed Bug to the standard Vref speed of 118 kts despite the REF SPEEDS switch being set to INCR, so the stick shaker activation was not expected by the crew at 130 kts. Rather than release back pressure and add power, as he was trained to do, the captain pulled back on the yoke. Less than two seconds following stick shaker activation, the control column went from 2 to 6 degrees. The nose pitched up, the angle of attack increased rapidly, and the airspeed decreased.

Contrary to his Colgan Air training, the captain did not add full power after the onset of the stick shaker. Instead, the captain waited three seconds after the onset of the stick shaker before increasing power to only 75% torque. As a result, in the seven seconds following onset of the stick shaker, airspeed rapidly decreased to 100 knots, and the stick pusher activated.

The stick pusher became fully active at 2216:36, when the aircraft pitch attitude was approximately 27 degrees, the angle of attack was approximately 36 degrees, and the airspeed was approximately 100 knots. The captain again pulled back on the yoke. In the three seconds following full stick pusher activation, the control column's pitch increased over 9 degrees. The nose of the aircraft eventually dropped below the horizon, and the aircraft ended up in a severe nose low attitude from which a recovery was not possible.

Runs performed by the NTSB in the FlightSafety Q400 simulator in St. Louis demonstrate that if the accident flightcrew had performed according to Colgan Air training on approach to stalls, a stall would have been avoided. See Human Performance Group Chairman Factual Report, Addendum 1, Attachment 3. Applying the proper control inputs in response to the stick shaker activation prevented the stick push from activating during the runs. Id. Further, the recoveries were uneventful and did not result in any unusual attitude situations. Id.

2.2 The Lack of Warnings Regarding the Effect of Setting a Non-Ice Vref Speed with the REF SPEEDS Switch Set to INCR Led to the Stall Warning

Flight 3407 was in icing conditions from shortly after takeoff until the accident that occurred on short final. The crew correctly activated the aircraft de-icing systems shortly after takeoff and also correctly positioned the REF SPEEDS switch to INCR at that time. However, the flight crew errantly set the #1 Speed Bug to the normal Vref speed with the REF SPEEDS switch set to INCR during the descent into BUF, which allowed for stick shaker activation at an airspeed greater than the Vref speed set in the #1 Speed Bug. The

fact the crew set a normal Vref speed meant they would not have expected stick shaker activation unless the airspeed had fallen below the normal Vref speed. Accordingly, the activation of the stick shaker most likely surprised the crew, and they may not have properly analyzed the stick shaker activation (i.e. the speed was too high for stall warning). Because there were no warnings or checklist items to remind the crew of the necessity to increase the approach and reference speeds (Vapp and Vref) by 20 knots, they were unprepared for the activation of the stick shaker.

The “Take-off in or into Icing Conditions” section of the Q400 AFM and AOM contains a warning that states as follows:

CAUTION

If airspeed is not increased before REF SPEEDS switch is set to INCR, stall warning may occur.

See AFM § 4.7.2.1 (Exhibit 2KK); AOM § 2.15.7.19 (Exhibit D, attached hereto).

However, this warning is not set forth under the Landing in Icing Conditions section of the Q400 AFM and AOM, and thus was not applicable to the regime of flight in which the stall warning occurred. See AFM § 4.7.2.4 (Exhibit 2KK); AOM § 3.4.6.5 (Exhibit 2SS). In fact, those sections of the AFM and AOM do not even reference the REF SPEEDS switch. Further, neither the AFM nor the AOM contains a warning that if a normal Vref speed is bugged with the REF SPEEDS switch selected to INCR, a stall warning may occur at speeds greater than the non-ice Vref speed. Colgan Air has since added warnings regarding the operation of the REF SPEEDS switch to its checklists. See Section 1.27, above.

Also, the act of setting a normal Vref speed with the REF SPEEDS switch set to INCR does not trigger any visual or aural warning in the Q400. Thus, the aircraft does not provide the flight crew with feedback indicating that this combination could potentially trigger a stall warning at speeds well above the bugged Vref speed.

If the flight crew had received the warnings referenced above, they likely would have bugged the icing Vref speed (in this instance 138 kts. [Vref + 20 kts]) and would have added power to the aircraft sooner to stabilize the airspeed at a speed greater than the stick shaker activation speed. Further, the crew would have been more aware of the possibility of stick shaker activation. Accordingly, lack of such warnings contributed to the accident.

2.3 The Lack of a Warning or Caution Light Alerting the Flight Crew to the REF SPEEDS Led to the Stall Warning

The INCR REF SPEED display that appears on the Engine Display of the Electronic Instrument System when the REF SPEEDS switch is set to INCR is white in color, rather than amber or red. Also, the switch has no impact on any engine or engine-related

functions. Further, there is no corresponding display on the Warning and Caution Lights Panel.

FAR 25.1322 requires that Caution Lights – lights indicating the possible need for future corrective action – be amber in color. The REF SPEEDS switch appears to be unique to the Q400 and the consequences of not following the proper procedures when the switch is set to INCR are quite serious, especially given the significant performance penalties (i.e. requirement to add 20 knots to Vref speed and increase landing field length by 25%). Therefore, the INCR REF SPEED display light should be amber and located on the Warning and Caution Panel to ensure that the flight crew is aware of its position prior to setting the Vref bug speed.

The lack of appropriate caution/warning lights increases the likelihood that a flight crew may not realize the REF SPEEDS switch is set to INCR, and thus may select a normal Vref speed that will serve to raise the stick shaker activation speed above the low speed cue. If the REF SPEED selection had triggered appropriate caution/warning lights, the flight crew would have more likely to realize the switch was set to INCR and that Vref ice speeds should be bugged. Accordingly, the lack of such caution/warning lights contributed to the accident.

2.4 The Flight Crew's Sterile Cockpit Violations May Have Caused a Loss of Situational Awareness

The accident flight crew violated Colgan Air policy and FAA regulations by breaking sterile cockpit during the descent to BUF. These violations may have distracted the crew from their duties and may have contributed to the cause of the accident. The sterile cockpit violations are as follows:

<u>Time</u>	<u>Topic of Conversation</u>
2205:08	Discussion of Saab procedures
2206:45	Swearing/laughing
2208:02-2208:11	Discussion of Colgan operations – other Colgan aircraft at gate
2209:26 – 2209:35	Discussion of ears popping
2210:57 – 2213:14	Discussion of flying in NE after flying in Phoenix – experience in icing when interviewed and number of hours Renslow flew before getting hired and experiences in icing
2213:58	Further comment by CA relative to above conversation

These violations, however, cannot be attributed to Colgan's policies, checking, or training. Colgan Air has a clear policy against violating sterile cockpit which is part of Colgan's training and is enforced by Colgan Air check airmen. Colgan's policy on sterile cockpit did not contribute to the accident.

Colgan's sterile cockpit procedures are covered in ground school during general indoctrination training for pilots on the first day during review of FOPPM subjects. See Human Performance Group Chairman Factual Report, p. 28. During this review, applicable manual policies and pages are referenced. Id. Pilots are also trained on critical phases of flight in basic indoctrination. Id. at 29. Sterile cockpit procedures are expected to be followed during checkrides and they also expect to see it briefed during a captain's preflight briefing. Id. Read-and-sign memo 08-04, dated March 6, 2008, was issued by the Director of Flight Standards on "Airspeed Awareness for Q400 Operations." The memo stated:

The Flight Operations Policy and Procedures Manual has an Altitude Callouts Table on page 5-39. The guidance is that the PF crewmember will make the 10,000 feet MSL call out. This altitude has much significance such as sterile cockpit, pressurization checks and Flight Attendant notification. With the Q400 we must now be prepared to scan the instruments for proper airspeed.

See Human Performance Group Chairman Factual Report, p. 29.

During post-accident interviews, one first officer stated that the company adheres to sterile cockpit procedures. See Human Performance Group Chairman Factual Report, p. 29. Another first officer said the captains he flies with very seldom deviate from sterile cockpit procedures and he has spoken up when they do. Id. When these rare violations occur, he directs the captain to the business at hand, such as asking about the descent check or the approach briefing, to remind them they are in the sterile cockpit period. Id. Check airmen and captains also stated that the pilots they fly with maintain sterile cockpit. Id. Some said if pilots forget they will correct the situation by reminding them they are under sterile cockpit. Id. Others said that ignoring a statement conveys the proper message. Id.

The FAA APM stated he had not seen any "red flags" suggesting Colgan had any problem with sterile cockpit before the accident. See Human Performance Group Chairman Factual Report, p. 29. Similarly, the POI stated that FAA surveillance of Colgan before the accident did not indicate there was a problem with crew adherence to sterile cockpit procedures; and based on his knowledge of the company's own oversight findings there has been no indication of a problem either. Id.

Colgan Air uses irregularity reports for reporting violations of standard operating procedures such as sterile cockpit violations. See NTSB Public Hearing Transcript, pp. 217-18. Reports are discussed between the Director of Operations and the Chief Pilot. Id.

The offending flight crew is removed from flight status and is reported to Flight Standards. Id. Incidents of violation are few.

2.5 The Flight Crew Did Not Adhere to Colgan Air Policy on When Checklists Should Be Accomplished

The Q400 CFM states in Section Five, “normally, the PF calls for the DESCENT checklist when descending through 18,000’ or at the top of descent if cruise altitude is below 18,000’.” The Descent Checklist reads as follows:

Altimeters	SET/CROSSCHECK	CR
Fuel Balance	CHECK	PM
Pressurization	SET	PM
Cabin PA	COMPLETE	PM

See CFM, Section 5.

Here, cruise altitude was 16,000 feet. Captain Renslow, however, did not call for the descent checklist until 2,980 feet.

The CFM also provides that

The PF calls for the APPROACH checklist with sufficient time to complete it prior to crossing the initial approach fix or transitioning to the initial approach phase during an instrument approach.

Here, Captain Renslow called for the approach checklist immediately after completion of the descent checklist. The approach briefing was not done as part of the check, but instead was done during descent from 11,000 at 2204-2205.

The flight crew’s deviations from checklist discipline, sterile cockpit, and other standard operating procedures are very unusual for Colgan Air pilots. Line checks conducted by Colgan Air check airmen and FAA APDs prior to the accident found very high compliance with FARs and Colgan Air procedures. Flight observations conducted on all Colgan Air pilots following the accident similarly showed high rates of compliance and only minor deviations.

2.6 FO Shaw Did Not Properly Manage Her Personal Schedule Preceding the Accident

The facts regarding FO Shaw’s overnight commute demonstrate that even though she had three days off prior to February 12th, she did not plan her personal time properly prior to reporting for duty. Rather than commuting to EWR on Feb. 11 and staying in a hotel, she chose an overnight commute.²¹

²¹ Linda Morris, FO Shaw’s mother, stated that FO Shaw planned to use hotels to obtain rest. See Human Performance Group Chairman Factual Report, Addendum 1, pp. 4-5.

It appears that FO Shaw did not have time for adequate sleep in the 24 hours preceding the accident. However, she also took a lengthy nap on the morning of the accident flight, and said she was “feeling great.” See Human Performance Group Chairman Factual Report, Addendum 1, p. 6. No one noticed she was fatigued or ill. Based on comments of FO Shaw on the CVR, however, it is apparent that her health deteriorated at some point prior to the flight, yet she chose to fly rather than call in sick.

Despite these facts, it is unclear if fatigue or illness played a role in the accident. During the flight, FO Shaw did not state she was fatigued or had trouble staying awake. Further, review of the CVR transcript shows FO Shaw was alert and responsive to Captain Renslow, ATC, and dispatch communications during the 53 minute flight.

2.7 Captain Renslow May Not Have Properly Managed His Personal Schedule Preceding the Accident

Based on post-accident interviews and review of phone records, it appears Captain Renslow may not have managed his personal time appropriately in the days preceding the accident and, as a result, may have been fatigued.

After finishing a trip on February 5, Captain Renslow had the next five days off work. See Human Performance Group Chairman Factual Report, p. 6. On February 9, 2009, he spent the day at home in the Tampa area. Id. At 1713, he departed Tampa and arrived in EWR at about 2005. Id. At 2247, he made a 6 ½ minute phone call. Id.

The first officer who flew with Captain Renslow on February 10th stated that Captain Renslow spent the night of February 9th in the crew room at EWR. See Human Performance Group Chairman Factual Report, p. 6. It is against Colgan Air policy to spend the night in the crew room. A hotel or a shared apartment is a more appropriate place to receive quality rest. Further, Captain Renslow’s report time on February 10th was 0530. Id. Since Captain Renslow was apparently on a phone call shortly before 11:00 p.m. on February 9th, it appears he did not receive more than six hours of sleep.

On February 10, Captain Renslow had a duty day of 7:49 (hh:mm), which included 4:36 of flight time. Id. The trip ended at BUF at 1259. Id. Captain Renslow had the rest of the day off. Id. According to the first officer who was flying with Captain Renslow that day, they spent the afternoon and evening relaxing at the hotel. Id. The first officer last saw Captain Renslow about 2100-2130 as they left the pool-community area of the hotel to go to their rooms. Id. Phone records indicate the captain made a 30 minute call at 2102. Id.

On February 11, the first officer reported seeing Captain Renslow in the hotel breakfast area at approximately 0500. Id. Accordingly, even though the captain had a 16:56 rest period, he likely did not receive more than seven hours of sleep.

Captain Renslow's duty day on February 11 was 9:49, which included five hours of flight time. See Human Performance Group Chairman Factual Report, p. 7. His last flight that day arrived at EWR at 1544. Id. During post-accident interviews, the first officer said Captain Renslow had told him he was going back to his apartment that evening. Id. The first officer stated the captain's health appeared very good and the captain was well rested and alert during the flights on February 10 and 11. Id.

On February 11, Captain Renslow placed or received calls between 1552 and 1637, 1823 to 1829, and 2020 to 2142. See Human Performance Group Chairman Factual Report, p. 7. Crew Trac logon records indicate that he had multiple logons from 1610 to 1640, 1759 to 1831, and 2059 to 2110. Id. The last logon occurred at 2151. Id. Accordingly, Captain Renslow likely did not fall asleep until after 2200 on February 11th.

On February 12, at 0310, Captain Renslow logged onto the CrewTrac system, accessed the crew menu and acknowledged a revision to the accident trip's schedule. See Human Performance Group Chairman Factual Report, p. 7. Captain Renslow logged on again at 0726, and used his phone several times between 1000 and 1100. Id. Between 1200-1400, he volunteered to perform some office work for the regional chief pilot. Id. At 1624, he made a call and at 1649 a call was received. Id. Other calls were made in the early evening hours before the accident flight. Id. at 7-8.

While Captain Renslow may have been napping periodically in the early morning hours of February 12th and at other times during the day, his primary rest period for the night of February 11 was likely less than five hours. Despite having ample time off duty in the three days preceding the accident, it appears Captain Renslow averaged less than six hours of overnight sleep in that time period. Accordingly, it is possible he was fatigued during the accident flight.

2.8 Colgan Air Has a Careful, Robust Hiring Process

Colgan Air's hiring process did not contribute to the accident. As set forth in Section 1.15, above, Colgan Air has a rigorous, multi-tiered evaluative process which Captain Renslow and First Officer Shaw successfully completed. Colgan Air pilots meet the same high, federally-mandated standards as pilots at major air carriers. See Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009, p. 4. All Colgan Air captains hold an airline transport pilot rating, the highest level of pilot certification offered by the FAA. Id. at 5. Colgan Air pilots often come from major flying schools, bridge programs, or other Part 121 carriers.

At least two-thirds of the pilot applicants who are initially contacted for interviews are not offered employment. See Operations 2H, Interview of Vice President of Administration Mary Finnigan, p. 46; Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009, p. 4. Pilots who do get hired become training candidates. See NTSB Public Hearing Transcript, pp. 311-15; Statement of Dan Morgan before the

Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009, p. 4. As a training candidate, the pilot undergoes ground training, simulator training, and checkrides. See Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009; NTSB Public Hearing Transcript, pp. 311-15. While the candidate is in training, the PRIA paperwork is received and reviewed. Id. The pilot does not begin line service until he/she passes the PRIA check, criminal records check, national driver registry check, ground training, simulator check, and a checkride. Id. Captain Renslow and FO Shaw both successfully completed the hiring process and were successful training candidates.

As set forth above, Captain Renslow was not truthful in his application to Colgan Air and failed to disclose two prior certificate disapprovals. Colgan Air complied with PRIA, but PRIA did not cover these disapprovals because Captain Renslow was not working as a pilot at the time.

Colgan Air also followed all FAA recommendations that pertain to pilot hiring. At the time Renslow was hired, the FAA had not provided any guidance on the use of FOIA to obtain additional pilot information. Prior to the accident, the FAA did not have clear procedures in place for obtaining Notices of Disapproval, and not a single air carrier was using FOIA.

2.9 Colgan Air Has a Thorough and Effective Pilot Checking Program

Captain Renslow failed two checks at Colgan Air (Recurrent Proficiency Training in SF-340 (10-17-06) and ATP for SF-340 (10-15-07)). See Operational Group Chairman Factual Report, p. 5. Both times he was successfully retrained. He passed four training events and six checking events in the 16 months between his last failed check and the accident, including checks administered by FAA APDs. See NTSB Public Hearing Transcript, p. 296.

First Officer Shaw had a good checking history. She did not fail any checking events at Colgan Air. See Operations 2BB.

2.10 Colgan Air Q400 Training Program is Robust

Colgan's Q400 training program was not a factor in the accident. Colgan Air had a robust, FAA approved, Q400 training program. Colgan's program is closely modeled on the training program used by Flight Safety International, which is the manufacturer's designated flight training company. See Operations Group Chairman Factual Report, p. 35. Colgan's training program was reviewed and approved by the FAA. Colgan uses the flight simulators of Flight Safety International for its Q400 trainees as well as other state of the art equipment such as a flight management system trainer and a ground flight simulator. Id.; NTSB Hearing Transcript, p. 158.

Before Colgan Air pilots can operate a Q400 aircraft as a fully-qualified crew

member, they must complete 156 hours of Q400 flight and ground training, including:

- a. normal and abnormal procedures training;
- b. stall recovery procedures training;
- c. winter operations training;
- d. sterile cockpit procedures;
- e. aircraft systems;
- f. standard operating procedures;
- g. an online Flight Management System training course;
- h. three cockpit procedures training sessions;
- i. four observation flights with experienced Q400 pilots;
- j. at least 20 hours flying with a check airman observing; and
- k. two successful check rides

Before Captain Renslow flew a single passenger as Pilot in Command in the Q400, he received:

- a. 156 hours of Q400 flight and ground training;
- b. four observation flights with experienced Q400 pilots;
- c. over 20 hours flying with a check airman observing him; and
- d. two successful check rides

Colgan Air's captains have, on average, over 4,600 hours of flight time. See Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, U.S. House of Representatives, June 11, 2009, p. 5. Every captain has an Airline Transport Pilot rating, which is the highest level of pilot certification available. Id. All pilots are "type-rated" on the specific aircraft they fly, and all ratings are issued by the FAA. Id.

Captain Renslow had 3,379 total hours of flight experience and was Airline Transport Pilot rated and held a "type certificate" in the Q400. See Operations Group Chairman Factual Report, pp. 4, 6.

First Officer Shaw had 2,244 total hours of flight experience. She had 774 hours flying the Q400 aircraft, qualifying her fully in accordance with all applicable Federal Aviation Regulations. See Operations Group Chairman Factual Report, p. 7.

Colgan Air's Captain Upgrade curriculum includes CRM, situational awareness, and leadership training. See Human Performance Group Chairman Factual Report, pp. 15-16.

FO Shaw was trained on the Q400 at Flight Safety International in Toronto, Canada. A first officer who trained with FO Shaw in Toronto said FO Shaw had good knowledge of the airplane. See Human Performance Group Chairman Factual Report, p. 8. The check airman who conducted the IOE in March 2008 said FO Shaw did well and he did not recall airplane handling issues or her struggling to keep up with the airplane. Id. at 8-9. He described her as a good pilot, pretty sharp, assertive and thorough. Id. at 9.

FO Shaw had a positive reputation among captains she had flown with for being a pilot who did a good job and performed as expected. See Human Performance Group Chairman Factual Report, p. 9. A captain who had flown with her multiple times said she was average to above average for her level of experience. Id. He described her as proficient, and as a monitoring pilot she was always ahead of the airplane, not complacent, and she cross checked what she did. Id.

In post-accident interviews, several captains remarked that based on FO Shaw's abilities she would have upgraded to captain in time. See Human Performance Group Chairman Factual Report, p. 9. She was characterized as assertive and not overly talkative or chatty in the cockpit. Id. None of the captains who were interviewed reported any difficulties with her adhering to sterile cockpit procedures, nor did they observe her making any configuration changes to the airplane unprompted while they were the flying pilot. Id.

The ground school instructor for FO Shaw's recurrent training in January 2009 described her as enthusiastic and attentive, and thought she had good knowledge of the airplane based on questions she answered. Another first officer in that class described the accident first officer as being more experienced in technical knowledge than the average first officer. See Human Performance Group Chairman Factual Report, p. 9.

2.11 Colgan Air Provides Appropriate Remedial Training

FAA Notice 8900.71 prescribes remedial training for Part 121 operators. The Notice directs the FAA's Principal Operation Inspectors to determine if operators under their surveillance had voluntarily accomplished the recommended action listed in FAA SAFO 06015, the purpose of which was to promote voluntary implementation of the remedial training programs for pilots with persistent performance deficiencies. See Human Performance 14I. Specifically, the SAFO recommended that the directors of safety, whose carriers did not have such programs, to recommend a process to top managers that would identify pilots who have persistent performance deficiencies and who have experienced multiple failures in training and checking. Id. The SAFO suggested that the three objectives be accomplished by the operator: 1) review the entire performance history of any pilot in question; 2) provide additional remedial training, as necessary; and 3) provide additional oversight to ensure that performance deficiencies are effectively addressed and corrected. Id.

Colgan Air provides remedial training for crewmembers with unsatisfactory checkrides. See Operations Group Chairman Factual Report, p. 40. If a pilot has performed unsatisfactorily, the Director of Flight Standards notifies Training and establishes a plan to provide additional training. Id. If the pilot does not pass the recheck, he/she may be terminated. Id. Also, the Chief Pilot reviews pilots with prior training deficiencies to determine if they are suitable for upgrade and transition. See Operations Group Chairman Factual Report, Addendum 3, Attachment 6. The Chief Pilot also speaks with the candidate to satisfy himself that the candidate is suitable for upgrade/transition

and to inform the candidate of any further checking that will be done prior to upgrade or transition. Id.

In addition, the FAA is notified by Colgan Air whenever a pilot fails a checkride. The failure is passed to the FAA air crew program manager for the particular fleet type (Saab 340 or Q400), who will sit in on the re-checks if they believe it is necessary.

Following the accident, Colgan Air reviewed the checking history of all its 420 pilots and found that only six had more than one check ride failure at Colgan Air. See NTSB Public Hearing Transcript, p. 204.

2.12 Colgan Air Provided the Flight Crew with Proper and Thorough Stall Training

Captain Renslow and First Officer Shaw received the required stall training that was part of Colgan's FAA approved training program for the Q400. Colgan meets all FAA requirements for stall training, and Colgan's stall recovery procedures follow the FAA's Practical Test Standards.

Captain Renslow and First Officer Shaw also received substantial stall warning training and checking prior to operating Q400s at Colgan Air. For example, a pilot must pass a certification check ride in which stalls are a required maneuver to obtain each grade of license (i.e., private pilot, instrument rating, commercial rating, and multi-engine rating). Therefore, prior to entering a Part 121 training program, every single pilot must have shown proficiency in recovering from a stall during four certification events. Captain Renslow would have demonstrated the proper recovery procedure of releasing back pressure on the yoke, instead of pulling back, at the initiation of the stick shaker, during six certification events at a Part 121 airline (in addition to his 12 training sessions).

Captain Renslow performed at least 35 stall recovery procedures during his career at Colgan Air. He was also trained in stall recovery at Gulfstream International Airlines. The stall training and checking Captain Renslow received throughout his aviation career is important because stall recovery procedures are the same for every aircraft – decrease the angle of attack, add power, and correct the roll.

Colgan Air's FAA approved Q400 training program did not include stick pusher training. Stick pusher simulator training, however, is not a standard practice in the airline industry. If a pilot responds appropriately to the stick shaker, he/she will not experience the stick pusher. Further, Bombardier does not publish a procedure for recovery from a deep stall, only stall warning recovery. Like Colgan Air, other Q400 operators, such as Porter Airlines, taught recovery from stall warning rather than deep stall.²² See Operations Group Chairman Factual Report, Addendum 3, Attachment 4.

²² Colgan also had simulator training including upset recovery training (nose low, nose high, high bank angles, etc.).

In addition to his training in the Q400, Captain Renslow received stall training in the Saab 340, which included stick pusher training. He would have felt operation of the Saab stick pusher on almost 100 occasions. See Spreadsheet of Captain Renslow's Originating Flights in Saab 340 and Q400. As set forth in Section 1.24, above, the stall warning system for the Saab 340 and Q400 include the stick shaker and the stick pusher, and the operation of each is very similar. The force exerted by the stick pusher in the Saab 340 and Q400 is also quite similar.

The fact that the Saab 340's stall warning system (including the stick pusher) is so similar to that of the Q400 means that operation of the Q400 stick pusher would not have been a novel sensation to Captain Renslow.

The fact that Colgan Air's stall warning training was not a factor in the accident is apparent from test runs performed by the NTSB. These runs demonstrate that if a pilot responds to a stall in accordance with Colgan Air's stall training, a Q400 stall will be quickly corrected. See Human Performance Group Chairman Factual Report, Addendum 1, Attachment 3. The stick pusher did not activate during any of the NTSB's test runs. Id. The recoveries were uneventful and did not result in unusual attitudes. Id.

During the accident flight, Captain Renslow did not follow Colgan Air's training on approaches to stalls. In response to the stick shaker, Captain Renslow applied only 75% power, and pulled back on the yoke, rather than reducing the angle of attack and adding full power. It is unclear why Captain Renslow did not follow his training. Colgan Air's stall training is not a factor in this accident.

2.13 Colgan Air Provides Appropriate Winter Operations Training

According to Bombardier's testimony at the public hearing, the Q400 cannot tail stall. Colgan Air does not train its pilots on tail stall recognition or recovery, nor does Colgan Air have any written guidance or prescribed procedures for tail stall recognition or recovery. It is not possible to train for tail stalls in the simulator, and Colgan Air pilots are not exposed to any tactile or hands-on experience with tail stalls.

Colgan Air, however, does provide its pilots with winter operations training. Part of this training includes a NASA video that is used for general education (Icing for Regional & Corporate Pilots). This video is also shown in initial and recurrent ground school. Captain Renslow and FO Shaw both saw the NASA video as part of their training. See Operations Group Chairman Factual Report, p. 38. Their most recent training events that included the NASA video were as follows:

- Captain Renslow completed transition winter operations anti-ice/de-ice training on October 31, 2008, during transition training for the Q400.
- FO Shaw completed recurrent winter operations anti-ice/de-ice training on January 15, 2009.

The NASA video discusses the latest information from NASA and the FAA about icing. The purpose of the video, as stated in its introduction, is:

- to review fundamentals of aircraft icing
- to enhance the pilot's ability to assess hazardous icing conditions
- to enhance the pilot's understanding of icing effects on stability and control of the aircraft
- to present strategies that pilots can use to exit a hazardous icing encounter
- to discuss super cooled large droplets (SLD)

One subject the video also discusses is the possibility of horizontal stabilizer icing and associated tail stall. It explains differences between conventional wing stall and tail stall.

The video states, in part, that in the event of a wing stall, recovery requires reduction of the angle of attack, which is accomplished by lowering the nose, adding power, and lowering flaps one notch.

It also states that pilots should be alert to the warning signs of a tail stall. These include:

- Lightening of the controls
- Pitch excursions
- Difficulty in trimming pitch
- Buffeting of the controls
- Sudden nose down pitch

The video states that to recover from a tail stall, a pilot must:

- Pull back on the yoke
- Reduce flaps
- Reduce power (some aircraft)

The video states that the pilot must first properly diagnose the problem. It states that airspeed awareness is absolutely critical and, although the differences between wing stall and tail stall can be subtle, the recovery techniques are quite different.

At the public hearing, a witness from Bombardier testified that the Q400 cannot tail stall. See Testimony of Allan Paige, NTSB Hearing Transcript, p. 102.²³ Another Bombardier witness testified that he conducted the certification test flying for the Q400 and determined the aircraft did not have any tailplane stall tendencies. See Testimony of Wally Warner, NTSB Hearing Transcript, pp. 144-48. However, prior to the time of the accident,

²³ Mr. Paige testified that he was Bombardier's lead engineer in the flight sciences department and was in charge of assessing and evaluating the handling characteristics of the Q400. See Testimony of Allan Paige, NTSB Hearing Transcript, p. 42.

there was no pronouncement from Bombardier stating definitively that the Q400 cannot tail stall. See Testimony of Allan Paige, NTSB Hearing Transcript, p. 103.

In fact, tail stall guidance is still included in Bombardier's Q400 AOM. See AOM 3.4.6.5, Operations 2SS, which states in pertinent part as follows:

If landing flap selection is accompanied by stick force lightning or stick force irregularities, immediately retract flap to lesser setting. Cycle wing/tail de-icer boots several times and if possible, land using a smaller flap setting. (This condition, which is the precursor to tail stall, will not occur if AOM icing procedures are followed).

The Bombardier witness did not know why this language was included in the AOM. See Testimony of Allan Paige, NTSB Hearing Transcript, p. 102. Bombardier has not yet clarified in writing that the Q400 cannot tail stall.

Horizon Airlines had a note regarding tail stall in its Q400 manual which stated that if the controls lightened when selecting landing flaps, the aircraft could be in a tail stall. Since the accident, they have removed that note. See Interview notes of Don Wiens, Addendum 3 to Operations Group Chairman Factual Report. Lynx Aviation, another Q400 operator, had a brief word-for-word excerpt from the Bombardier AOM in their manual, but did not train on tail stalls and did not show the NASA video in their ground school training. Some pilots, however, circulated the video amongst themselves. See Interview notes of Ryan Peck, Addendum 3 to Operations Group Report. Porter Airlines did not refer to tail stall in their manuals or procedures, but did mention it as a general subject in their ground school. That element has been removed from ground school since the accident.

Colgan Air did not train its pilots on tail stall recognition or recovery. There are no references to tail stall or tail stall recovery techniques in the Colgan Air Crew Member and Dispatcher Training Program Manual. There is no indication the accident aircraft suffered a tail stall. Colgan Air's training is solely geared toward wing stalls. Further, the Q400's stall protection system is only activated by a wing stall.

2.14 FO Shaw Had Substantial Winter Operations Experience

Both Captain Renslow and FO Shaw had extensive experience flying in icing conditions.²⁴

At the public hearing, there was discussion of remarks made by FO Shaw regarding her experience in icing conditions that were misinterpreted. On the CVR, FO Shaw referred to not having experience with icing conditions when initially hired. Her later remarks clarified that her time with Colgan Air had given her such experience, "... now I'm so much more comfortable with it all." See CVR Factual Report – Addendum, p. 12-106.

²⁴ The flights of FO Shaw, rather than those of Captain Renslow, are emphasized, as FO Shaw was the less experienced pilot and a misinterpretation of the CVR transcript has caused unwarranted speculation that FO Shaw was not experienced in icing conditions.

A review of weather for the flights operated by FO Shaw from November 1, 2008, to the time of the accident shows that FO Shaw flew in icing conditions on approximately 30 occasions either in the takeoff/climb, cruise, or approach/landing phase. See November 20, 2000 letter to Lorenda Ward. Many of these flights involved snow or freezing rain. Id. The flights are as follows:

November 13, 2008	EWR to BUF	Flight 3401	approach/landing
November 13, 2008	EWR to DCA	Flight 3405	approach/landing (possibly also in cruise)
November 20, 2008	EWR to BUF	Flight 3401	approach/landing (possibly also in cruise)
November 20, 2008	BUF to EWR	Flight 3404	takeoff/climb
November 27, 2008	EWR to BUF	Flight 3401	approach/landing
December 10, 2008	EWR to BUF	Flight 3401	approach/landing (possibly also in cruise)
December 10, 2008	BUF to EWR	Flight 3404	takeoff/climb and cruise
December 12, 2008	ORF to EWR	Flight 3223	takeoff/climb and possibly in cruise
December 12, 2008	EWR to ORF	Flight 3220	takeoff/climb and possibly in cruise
December 12, 2008	ORF to EWR	Flight 3227	approach/landing and possibly in cruise
December 16, 2008	BUF to EWR	Flight 3404	approach/landing
December 16, 2008	EWR to ORF	Flight 3224	takeoff/climb, enroute, and approach/landing
December 19, 2008	EWR to ORF	Flight 3349	takeoff/climb (possibly also in cruise)
December 19, 2009	ORF to EWR	Flight 3223	approach/landing
December 21, 2008	EWR to ORF	Flight 3228	takeoff/climb, descent/landing, and maybe cruise
December 26, 2008	ORF to EWR	Flight 3227	takeoff/climb and approach/landing
December 26, 2008	EWR to ORF	Flight 3228	cruise and approach/landing
January 6, 2009	ORF to EWR	Flight 3221	takeoff/climb and cruise
January 6, 2009	EWR to ORF	Flight 3222	cruise and approach/landing
January 11, 2009	ORF to EWR	Flight 3223	cruise and approach/landing
January 18, 2009	ORF to EWR	Flight 3227	takeoff/climb, cruise, and approach/landing
January 18, 2009	EWR to ORF	Flight 3228	takeoff/climb, cruise, and approach/landing
January 19, 2009	ORF to EWR	Flight 3225	cruise and approach/landing
January 19, 2009	EWR to PIT	Flight 3236	takeoff/climb and cruise (possibly approach/landing)
January 19, 2009	PIT to EWR	Flight 3239	takeoff/climb, cruise, and approach/landing
January 19, 2009	EWR to ORF	Flight 3228	takeoff/climb, cruise, and approach/landing
January 20, 2009	EWR to PIT	Flight 3236	approach/landing
January 20, 2009	PIT to EWR	Flight 3239	takeoff/climb
February 3, 2009	EWR to BUF	Flight 3407	takeoff/climb
February 4, 2009	EWR to BUF	Flight 3407	approach/landing and possibly in cruise flight

Id.

FO Shaw also may have encountered icing conditions on other flights, such as the following:

November 20, 2008	EWR to ORF	Flight 3224	possibly in cruise flight
November 21, 2008	ORF to EWR	Flight 3227	possibly in cruise flight
December 17, 2008	ORF to EWR	Flight 3227	possibly in cruise flight

Id.

In addition to this weather data, statements of captains who flew with FO Shaw in icing conditions confirmed her experience. Id. Captain Robert Golden flew with FO Shaw

for the majority of November 2008. Id. Captain Golden stated that he and FO Shaw often encountered icing conditions and FO Shaw responded to such conditions appropriately and followed Colgan Air's procedures. Id. He also recalled that FO Shaw recommended changes in altitude to potentially get out of icing conditions. Id.

Captain Sam Omair flew with FO Shaw during her initial operating experience (IOE) in March 2008. Id. He recalled that they flew in icing conditions and that FO Shaw was trained for those conditions, including operation of the deicing equipment and the reference speeds switch. Id. The following IOE flights were conducted in icing conditions:

March 19, 2008	BWI to EWR	Flight 3200	approach/landing, possibly in cruise flight
March 20, 2008	ALB to EWR	Flight 3221	takeoff/climb and cruise
March 20, 2008	ROC to EWR	Flight 3253	takeoff/climb and cruise
March 21, 2008	EWR to ROC	Flight 3250	possibly in cruise flight
March 22, 2008	EWR to PIT	Flight 3343	approach/landing and cruise

Id.

Captain John Dowd flew with FO Shaw in December 2008. Id. He recalled flying with her in icing conditions on several occasions. Id. Captain Dowd recalls that they performed the normal deice procedures and that FO Shaw never had any problems. Id.

Captain John Miller was paired with FO Shaw for January 2009. Id. He recalls flying with FO Shaw in icing conditions and that FO Shaw always followed correct procedures. Id. He recalls they landed once in icing conditions so the REF SPEEDS switch was left in the INCR position. Id. Other times they flew clear of icing conditions and turned the switch off. Id.

Captain William Isbell flew with FO Shaw in early February 2009, just days before the Flight 3407 accident. Id. He recalls they encountered snow and icing on February 4, 2009, on Flight 3407, and that the weather FO Shaw did not have any problems with deicing procedures. Id.

Captain Craig Margolin flew with FO Shaw in early November 2008. Id. On one of the trips, they encountered icing at cruising altitude. Id. He asked FO Shaw to look at her wing and tell him if the boots were shedding the ice. Id. She replied that the boots were working, and they both continued to check the wings periodically to make sure the wings were being cleared. Id. She never seemed nervous during this icing event. Id. This flight was either November 6, 2008, Flight 3401 from EWR to BUF, or November 6, 2008 Flight 3404 from BUF to EWR. Id. The icing event occurred closer to BUF. Id.

A pilot undergoing training would not be able to sit for a practical test if he had not completed and shown proficiency in the training module for procedures relating to the ice protection system and any malfunctions associated with that system.

In November 2008, Colgan Air issued a Winter Operations Quiz to all pilots on all

fleets. This was a quiz relating to general operations in a winter environment and had questions about the current revision of Chapter 7, Winter Operations, of the Flight Operations and Procedures Manual.

Winter Operations are covered during proficiency checks in the simulator twice a year for Captains, and once a year for First Officers, and also in recurrent training (ground school) once a year. See NTSB Public Hearing Transcript, pp. 210, 249.

Both Captain Renslow and FO Shaw were well trained in winter operations. Colgan Air pilots receive winter operations training to optimize their ability to operate safely in winter conditions. See NTSB Public Hearing Transcript, pp. 210-11. Both basic indoctrination and recurrent training covers winter operations generally and icing conditions specifically. Id. at 249-51. These areas are covered in ground training and in the simulator. Id. at 210, 249.

2.15 Colgan Air Pilot Scheduling Affords Ample Time for Pilot Rest

Colgan Air follows the duty and rest time regulations of the FAA. See Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, United States House of Representatives, June 11, 2009, p. 7. Colgan Air uses an automated crew scheduling system that tracks duty time and ensures compliance with the FAA's duty limitations and rest requirements. Id. Crew boards are pulled twice a day to analyze schedules. See Human Performance Group Chairman Factual Report, p. 22. The Director of SOC and the Manager of SOC are alerted if a crewmember is going to exceed 13 ½ hours of duty time. Id.

Colgan Air develops crew schedules to provide ample rest between duty days, and to allow periodic extended rest periods. For example, after a three or four consecutive day duty period, a pilot may have four or five days off. Colgan's monthly schedules are determined well in advance of the beginning of each month, which affords pilots ample time to be fully rested.

The schedules for Q400 pilots are built with maximum duty days of 12 hours, and with a maximum of 7 ½ hours of scheduled flight time during that duty period. See Statement of Dan Morgan before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, United States House of Representatives, June 11, 2009, p. 7. For example, the average for all scheduled flight and duty times for January 2009 was 4:44 and 8:59 respectively, with an average of 13 days off each month. Id.

Although sixteen-hour duty days are legal under FAA regulations, they are rarely assigned by Colgan Air. See NTSB Public Hearing Transcript, p. 330. In fact, duty days that exceed 14 hours must be reviewed by a senior operations manager prior to assignment, and Colgan Air will not assign a crew a duty day that exceeds 15 ½ hours unless the crew agrees. See Human Performance Group Chairman Factual Report, p. 22.

Regarding the accident flight crew, Captain Renslow had 27 hours off between

the accident flight and his last flight prior to the accident flight. First Officer Shaw had four days off duty before the accident flight (her last flight prior to the accident flight was in the afternoon of February 8).

2.16 Colgan Air Fatigue Policy Promotes Safety

Colgan Air has a simple, clear cut policy regarding fatigue – if you're fatigued, you don't fly. See FOPPM 3-124. You must remove yourself from duty. Id. Colgan Air's policy is also non-punitive. See NTSB Hearing Transcript, p. 233. The process for calling in fatigued is straightforward and taught to all pilots in basic indoctrination ground school. See NTSB Hearing Transcript, p. 23. This policy, and Colgan Air's emphasis on it, helps ensure pilots make the right decision not to fly fatigued.

Colgan Air's pilot schedules are generally comprised of several days working followed by several days off. It is not a five day per week, four weeks per month job. Instead, a pilot may work four days and then have four days off. In addition, crew schedules are provided at least nine days in advance, so the pilots have plenty of time to schedule themselves appropriately. For example, Captain Renslow had 22 hours off before reporting for duty on the day of the accident, and First Officer Shaw had three full days off.

Colgan Air uses CrewTrac, a computerized system, to ensure compliance with duty and rest time regulations. See NTSB Hearing Transcript, p. 293. Colgan pulls crew boards twice a day to analyze schedules, and strives to keep its pilots within a 14 hour day. See Human Performance Group Chairman Factual Report, p. 22; NTSB Hearing Transcript, p. 330. Colgan Air's Director of SOC and Manager of SOC are alerted if a crewmember is going to exceed 13 ½ hours. Id.

Colgan Air has operational policies that also reduce fatigue risk. For example, Colgan schedules several pilots on "hot reserve" at each crew base. See NTSB Hearing Transcript, p. 330. Any pilots that need to be taken off the line are removed and supplemented with a reserve pilot, and can make up the flight once properly rested. See NTSB Hearing Transcript, p. 342. Thus, the pilots understand that fatigue calls will not have an adverse operational effect.

Colgan Air also requires its crew members to have proper accommodations for rest at their base (such as shared commuter apartments). Accordingly, Colgan Air has a policy against use of crew rooms for overnight sleep. See Human Performance Group Chairman Factual Report, p. 27. A read-and-sign memo from the Newark chief pilot communicated this policy with respect to the Newark crew room and advised pilots they are responsible for their own overnight accommodations. Read and Sign Memo 08-13 dated May 24, 2008, reads in pertinent part as follows:

SLEEPING IN OPERATIONS

If a Crew Member is based in EWR than you are responsible for your own overnight accommodations. Sleeping in Operations or any crew room in EWR is strictly prohibited and will have severe disciplinary consequences, up to and including termination.

See Human Performance Group Chairman Factual Report, p. 28.

Company records indicate that both the captain and the first officer acknowledged receipt of this read-and-sign memo. In interviews with Colgan Air pilots, the pilots were aware of the policy against overnighting in the crew room, and none of the pilots had observed the crew room being used for overnight rest prior to going on duty. Id.

Pilot education also protects against fatigue. Issues of fatigue are addressed in the Airman's Information Manual and are part of every pilot's basic education. See NTSB Hearing Transcript, p. 234. Colgan Air reinforces the importance of not flying fatigued during ground school. See NTSB Hearing Transcript, p. 23. Also, in Captain Management Training, situational awareness and fitness for duty are discussed. See NTSB Hearing Transcript, p. 234. Colgan Air's CRM program also provides fatigue management tools, such as factors causing fatigue, symptoms of fatigue, sleep needs and napping, and tips for getting sleep. See Human Performance Group Chairman Factual Report, p. 15.

Colgan Air's Dispatch Release serves as another reminder of the importance of being well rested. A captain must certify on the dispatch release that he or she is physically qualified for the flight. See NTSB Hearing Transcript, p. 342. A fatigued pilot is not physically qualified.

In sum, Colgan Air's fatigue policy did not contribute to the accident.

2.17 Colgan Air Commuting Policy Was Not a Factor in the Accident

Like every airline, Colgan Air has pilots who commute. It is widely acknowledged that significant numbers of airline pilots commute to work. Making appropriate commuting arrangements is part of being a professional pilot. As FAA Administrator Babbitt pointed out following a recent incident, lack of professionalism cannot be regulated. An airline cannot monitor and control unprofessional uses of personal time, whether the same involves staying up late before an early morning flight, or traveling away from base on days off for personal reasons.

Colgan Air expects its pilots, and all its employees, to present fit for duty, regardless of where they reside. A commuting pilot is expected to report for duty in a timely manner. See Flight Crewmember Policy Handbook, pp. 1-5 and 1-6. Colgan Air requires its pilots to have appropriate sleeping accommodations at their base. Commuting pilots have various options available to them for residence while at their base, including shared apartments. The cost of an occasional hotel room or sharing an apartment is not prohibitive. Our pilots have not communicated to us that they were unable to find an affordable apartment in the greater Newark, New Jersey area.

Commuting, like all personal time, can be managed appropriately or inappropriately. Inappropriate decisions can lead to inadequate sleep periods and fatigue. Colgan Air's fatigue policy, scheduling policy, and pilot education and training help its pilots make the right decisions while guarding against the effects of poor decisions.

Colgan Air recognizes that commuting pilots sometimes encounter difficulties getting to work in time for their rest and their assignment. Therefore, Colgan Air offers these pilots an option to call the company in advance when they know they will not be able to report on time. This policy aids the company by ensuring there is ample time to reassign a flight to a reserve pilot, and also aids the pilot by letting them know they can notify the company of a missed assignment without facing punitive action. See NTSB Public Hearing Transcript, p. 293.

A pilot's decision regarding where to live is made for personal reasons. For example, FO Shaw chose to live in Seattle to be close to family and because the commute from Seattle was easier than the commute from Norfolk. See Human Performance Group Chairman Factual Report, p. 9; Human Performance Group Chairman Factual Report Addendum, pp. 4-5.

Linda Morris, mother of FO Shaw, and Michael Troy Shaw, the husband of FO Shaw, both told the NTSB that FO Shaw was not under any financial stress.²⁵ See Human Performance Group Chairman Factual Report, p. 9; Human Performance Group Chairman Factual Report Addendum, pp. 4-5. Linda Morris said the cost of an apartment in the greater Newark area was not an issue and, as a matter of preference, FO Shaw planned to stay in hotels when needed, rather than an apartment. A captain who had flown with her also mentioned she planned to use hotels. See Human Performance Group Chairman Factual Report, p. 10. Her husband said she enjoyed flying at Colgan Air and was proud to be flying the Q400. Her long term plans were to stay in aviation and eventually upgrade to captain. Id.

III. Probable Cause

The probable cause of the accident was the flight crew's loss of situational awareness and failure to follow Colgan Air training and procedures, which led to a loss of control of the aircraft.

IV. Contributing Causes

The following contributed to the accident:

1. The flight crew's failure to follow Colgan Air procedures and training regarding the proper response to a stick shaker.

²⁵ We are not aware of any facts indicating FO Shaw's choice of residence or commuting plan was influenced by her pay. On the contrary, all evidence is that pay had absolutely no bearing on these decisions.

2. The lack of an adequate cockpit warning system in the Q400 to warn the flight crew when a Speed Bug is set to a speed below the calculated stall warning speed.
3. The lack of an adequate warning in the Q400 Aircraft Flight Manual or Aircraft Operating Manual regarding the effect of setting a non-ice reference speed with the REF SPEEDS switch set to INCR during approach and landing.
4. The flight crew's non-pertinent conversation during the descent and approach phase, in violation of Colgan Air's training and procedures.

V. Recommendations

As a result of this accident, Colgan Air believes the NTSB should issue the following recommendations to the Federal Aviation Administration:

1. Require that a Caution or Warning be required in the Q400 AOM and AFM Landing in Icing Conditions sections that states as follows:

If Vref [not Vref(ice)] is used for landing, the REF SPEEDS switch must be selected to OFF or a stall warning may occur at a speed greater than Vref.

or

If a normal Vref speed is set in the Speed Bug when the REF SPEEDS switch is set to INCR, stall warning may occur at speeds greater than the selected Bug Speed.

and

If airspeed is within 20 knots of the Low Speed Cue, the airspeed must first be increased to greater than 20 knots above the Low Speed Cue before the REF SPEEDS switch is selected to INCR or a stall warning may occur.

2. Require that the INCR REF SPEED display that appears on the Engine Display when the REF SPEEDS switch is set to INCR is either: a) changed in color to amber or red; or b) moved to a Caution Light on the Warning and Caution Lights Panel.
3. Require that the Q400 Approach and Landing Checklist incorporate a specific positive response checklist item verifying the position of the REF SPEEDS switch and that the appropriate Vref speed is input in the Speed Bug and that landing field distance requirements are confirmed.
4. Require that the Q400 incorporate an adequate crew warning system when a Speed Bug is set to a speed that is below the calculated stall warning speed.

5. Establish a single, integrated database of pilot records that would provide airlines with real-time information about pilot qualifications and performance and would encompass not only information covered by PRIA, but also general aviation Notices of Disapproval and other Notices of Disapproval not currently covered by PRIA.
6. In order to allow airlines to monitor and improve pilot professionalism, airlines should be permitted to use confidential groups to analyze CVR data on an anonymous, non-punitive basis.

A



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

**Subject: PILOT RECORDS
IMPROVEMENT ACT OF 1996,
AS AMENDED**

**Date: 1/28/04
Initiated by: AFS-200**

**AC No: 120-68C
Change:**

1. PURPOSE. This advisory circular (AC) provides information and standard forms that may be used to comply with some of the provisions of Title 49 United States Code (49 U.S.C.) § 44703(h), Records of Employment of Pilot Applicants; § 44703(i), Limitation on Liability; Preemption of State Law; and § 44703(j), Limitation on Statutory Construction. This law is commonly referred to as the Pilot Records Improvement Act of 1996 (PRIA) and is contained in Section 502 of Public Law 104-264. Public Law 104-264, Section 502, shall apply to any air carrier hiring an individual as a pilot whose application was first received by the carrier on or after the 120th day (February 6, 1997) following the date of the enactment (October 9, 1996) of PRIA.

2. CANCELLATION. AC 120-68B, Pilot Records Improvement Act of 1996, As Amended, dated March 22, 2002, is canceled.

3. CHANGED INFORMATION. A vertical bar in the margin identifies revised, added, or deleted text.

4. APPLICABILITY. The guidance provided herein applies to:

a. An air carrier hiring an individual as a pilot;

b. An air carrier, or other person, that has employed an individual as a pilot of a civil or public aircraft at any time during the 5-year period preceding the date of the individual's employment application to an air carrier; and

c. Any individual applying for a position as a pilot with an air carrier who has been employed as a pilot of a civil or public aircraft at any time during the 5-year period preceding the date of the individual's employment application to an air carrier.

5. RELATED UNITED STATES CODE AND CODE OF FEDERAL REGULATIONS.

a. Certain U.S. Transportation Laws in 49 U.S.C.

b. Title 14 of the Code of Federal Regulations (14 CFR) Parts 121, 125, and 135.

c. Title 49 of the Code of Federal Regulations (49 CFR).

6. DEFINITIONS. The following definitions are provided to assist the reader in understanding the provisions of the PRIA.

a. Air Carrier (Reference: 49 U.S.C. § 40102(a)(2)). A citizen of the United States undertaking by any means, directly or indirectly, to provide air transportation.

b. Air Transportation (Reference: 49 U.S.C. § 40102(a)(5)). Foreign air transportation, *interstate air transportation*, or the transportation of mail by aircraft.

c. Interstate Air Transportation (Reference: 49 U.S.C. § 40102(a)(25)). The transportation of passengers or property by aircraft as a *common carrier for compensation*, or the transportation of mail by aircraft, between a place in: (i) a State, territory, or possession of the United States and a place in the District of Columbia or another State, territory, or possession of the United States; (ii) Hawaii and another place in Hawaii through the airspace over a place outside Hawaii; (iii) the District of Columbia and another place in the District of Columbia; or, (iv) a territory or possession of the United States and another place in the same territory or possession; and, when any part of the transportation is by aircraft.

(1) Common Carriage. “Common carriage” is defined as “holding out” to the general public or to a segment of the public as being willing to furnish air transportation for compensation. Common carriage also includes the carriage of people or property for compensation in aircraft, even if such carriage does not involve the transportation of people or property from one place to another on the surface.

(2) Holding Out. “Holding out” can be accomplished in many ways, including advertising through the telephone yellow pages, billboards, television, and/or radio.

d. Person (Reference: 1 U.S.C. § 1, and 49 U.S.C. § 40102(a)(33)). A “person” includes corporations, companies, associations, firms, partnerships, societies, and joint stock companies, as well as individuals. It also includes a governmental authority, trustee, receiver, assignee, and other similar representative.

e. Record. As used in this advisory circular, “record” means the individual pilot’s records that are maintained by an air carrier or person to meet the statutory requirements of 49 U.S.C. § 44703(h), and the records that are maintained by an air carrier or person to meet the regulatory requirements of the 14 CFR operating rule under which the air carrier or person operates.

7. BACKGROUND. On October 9, 1996, the President approved the Federal Aviation Reauthorization Act of 1996 (the Act) that was passed by Congress on October 3, 1996, as Public Law No. 104-264. The Act amended 49 U.S.C. to reauthorize programs of the Federal Aviation Administration (FAA) and to effect certain changes including pilot records. The PRIA was enacted primarily as a result of certain airline accidents attributable to pilot error, where it was later

found that, although the pilot(s) had a history of poor performance, the current employer had not investigated the pilot's background.¹ The PRIA was amended by Public Law 105-142, effective December 5, 1997, by Public Law 106-181, effective April 5, 2000, to give relief to air carriers for unnecessary burdens that were not originally contemplated, and by Public Law 107-71, effective November 19, 2001, to establish the Transportation Security Administration as well as for other purposes. 49 U.S.C. § 44703(h), (i), and (j), as amended, are reprinted in Appendix 1.

8. EMPLOYMENT RECORDS OF PILOT APPLICANTS.

a. Records Requests. Before allowing a pilot to begin service, the PRIA requires an employing air carrier to request and receive certain information concerning that individual. That information must include certain records from: (1) the FAA; (2) other air carriers or persons; and (3) the National Driver Register (see 49 U.S.C. § 44703(h)(1)).

NOTE: The employing air carrier is not required to request pilot records from any branch of the United States Armed Forces, the National Guard, or a reserve component of the United States Armed Forces (see 49 U.S.C. § 44703 (h)(1)(B)).

(1) Who must request records? An "air carrier" as defined under 49 U.S.C. § 40102(a)(2). An air carrier is an entity that conducts foreign air transportation, interstate air transportation, or transports mail by aircraft. If an air carrier holds Operations Specifications that authorize foreign or interstate air transportation, or if the air carrier transports mail, such air carrier must comply with the PRIA.

(2) Who must provide records? Any air carrier or person, or a trustee in bankruptcy for an air carrier or person, that has employed the individual as a pilot of a civil or public aircraft at any time during the 5-year period preceding the date of the employment application.

NOTE: Entities that employ pilots and maintain pilot records but are not air carriers must provide the records identified by PRIA to the requesting air carrier within the time specified.

(3) When must records be provided? An air carrier or person who receives a request for records pursuant to PRIA shall provide a copy of all records required under § 44703(h)(1)(A), (B), or (C), as applicable, that are maintained by the air carrier or person to the requesting air carrier **not later than 30 days after receiving the request.**

NOTE: The failure of an entity [air carrier or person] to provide the requested records within the statutory 30-day limitation should be reported to the Point of Contact listed on FAA's PRIA website at <http://www.faa.gov/avr/afs/pria/>.

¹ United States Congress, House of Representatives Committee Report - House Rpt. 104-684, H.R. 3536, Airline Pilot Hiring and Safety Act of 1996, p. 6. 1996.

(4) What records must be provided?

(a) FAA Records (See 49 U.S.C. § 44703(h)(1)(A)):

- 1 Current airman certificates with associated type ratings and limitations;
- 2 Current airman medical certificate including any limitations; and
- 3 Summaries of FAA legal enforcement actions resulting in a finding by the Administrator of a violation that was not subsequently overturned.

(b) Air Carrier and Other Records (See 49 U.S.C. § 44703(h)(1)(B)). Records required to be provided include:

1 *Records pertaining to the individual* that are maintained by an air carrier (other than records relating to flight time, duty time, or rest time) under regulations set forth in:

(aa) 14 CFR Part 121.

NOTE: DO NOT include records that DO NOT pertain to the *individual's performance as a pilot*. For example, an agreement between the pilot and air carrier/person to pay for training, personal bankruptcy papers, or unemployment compensation disputes between a pilot and air carrier/person are not considered to pertain to the individual's performance as a pilot.

i. Section 121.683 -- current records that show whether the crewmember complies with the applicable sections of Chapter 1, Title 14 CFR, including, but not limited to:

- Proficiency and route checks;
- Airplane and route qualifications;
- Training;
- Any required physical examinations; and
- Records of each action taken concerning the release from employment or physical or professional disqualification of the flight crewmember that was not subsequently overturned;

NOTE: Effective August 1, 2001, the drug and alcohol testing regulations in Appendices I and J of Part 121 were amended to include the provisions of 49 CFR Part 40, Procedures for Transportation Workplace Drug and Alcohol Testing Programs. Due to these amendments, the records referenced in

PRIA at 49 U.S.C. § 44703(h)(1)(B), (originally 49 U.S.C. § 44936(f)(1)(B)), are referenced in 49 CFR § 40.333(a)(1)-(2). Paragraph (ii) lists the records that are required by 49 CFR § 40.333.

NOTE: Request for drug and alcohol records required under PRIA shall be requested using the “Authorization For Release Of DOT Drug And Alcohol Testing Records Under PRIA And Maintained Under Title 49 Code of Federal Regulations (49 CFR) Part 40” which may be found in Appendix 7 and on the following website: <http://www.faa.gov/avr/afs/pria/>

ii. Appendix I and J, Part 121, and maintained in accordance with 49 CFR Part 40, Procedures for Transportation Workplace Drug and Alcohol Testing Programs, § 40.333:

- Records of alcohol test results indicating an alcohol concentration of 0.02 or greater;
- Records of verified positive drug test results;
- Documentation of refusals to take required alcohol and/or drug tests (including substituted or adulterated drug test results);
- Substance Abuse Professional (SAP) reports;
- All follow-up tests and schedules for follow-up tests;
- Information obtained from previous employers under 49 CFR § 40.25 concerning drug and alcohol test violations of employees; and
- Records of negative and cancelled drug test results and/or alcohol test results with a concentration of less than 0.02.

(bb) 14 CFR Part 125.

i. Section 125.401 -- current records that show whether the crewmember complies with the applicable sections of Chapter 1, Title 14 CFR, including, but not limited to:

- Proficiency and route checks;
- Airplane qualifications;
- Any required physical examinations; and

- Records of each action taken concerning the release from employment or physical or professional disqualification of the flight crewmember that was not subsequently overturned.

(cc) 14 CFR Part 135.

i. Section 135.63(a)(4) – current records that show whether the crewmember complies with the applicable sections of Chapter 1, Title 14 CFR, including, but not limited to:

- Full name;
- Pilot certificate (by type and number) and ratings held;
- Aeronautical experience;
- Current duties and the date of assignment to those duties;
- Effective date and class of medical certificate;
- Date and result of each of the initial and recurrent competency tests and proficiency and route checks required by part 135 and the type of aircraft flown during that test or check;
- Check pilot authorization, if any;
- Release from employment for physical or professional disqualification that was not subsequently overturned; and
- Date of the completion of the initial phase and each recurrent phase of the training required by part 135.

ii. Sections 135.251(b) and 135.255(b) -- records that pertain to Appendix I and J, Part 121, and maintained in accordance with 49 CFR Part 40, Procedures for Transportation Workplace Drug and Alcohol Testing Programs, § 40.333:

- Records of alcohol test results indicating an alcohol concentration of 0.02 or greater;
- Records of verified positive drug test results;
- Documentation of refusals to take required alcohol and/or drug tests (including substituted or adulterated drug test results);
- Substance Abuse Professional (SAP) reports;

- All follow-up tests and schedules for follow-up tests;
- Information obtained from previous employers under 49 CFR § 40.25 concerning drug and alcohol test violations of employees; and
- Records of negative and cancelled drug test results and/or alcohol test results with a concentration of less than 0.02.

2 Other records pertaining to the *individual's performance as a pilot* that are maintained by the *air carrier* or *person* concerning:

NOTE: A "person" includes corporations, companies, associations, firms, partnerships, societies, and joint stock companies, as well as individuals. It also includes a governmental authority, trustee, receiver, assignee, and other similar representative. Thus, any entity that is not an *air carrier* must also provide the requested records within the time specified.

(aa) Training records, e.g., initial and recurrent training records;

(bb) Qualifications, proficiency, or professional competence of the individual, including comments and evaluations made by a check airman designated under sections 121.411, 125.295, or 135.337 of 14 CFR. For example:

i. Documents that show the individual's qualifications as instructor/evaluator, check airman, or examiner; and

ii. Records of the individual's proficiency checks -- recurring checks for Captain, First Officer, or Line Checks.

(cc) Records of any disciplinary action taken with respect to the individual that was not subsequently overturned; and

(dd) Any release from employment or resignation, termination, or disqualification of the individual with respect to employment.

NOTE: DO NOT include records that DO NOT pertain to the *individual's performance as a pilot*. For example, an agreement between the pilot and air carrier/person to pay for training, personal bankruptcy papers, or unemployment compensation disputes between a pilot and air carrier/person are not considered to pertain to the individual's performance as a pilot.

b. Written Consent; Release From Liability.

(1) An air carrier must obtain written consent from the individual before the individual's records are requested (see 49 U.S.C. § 44703(h)(2)(A)).

(2) Provided there is no other provision of law or agreement to the contrary, an air carrier making a request for records under 49 U.S.C. § 44703(h)(1) may require the individual who is the subject of the records to execute a release from liability for any claim arising from the furnishing of such records to or the use of such records by such air carrier [other than a claim arising from furnishing information known to be false and maintained in violation of a criminal statute] (see 49 U.S.C. § 44703(h)(2)(B)).

c. Reporting Period. An air carrier or person providing records shall not furnish a record if the record was entered more than 5 years before the date of the request, unless the information concerns a revocation or suspension of an airman certificate or motor vehicle license and the revocation or suspension is in effect on the date of the request (see 49 U.S.C. § 44703(h)(3)).

d. Maintaining Records. The Administrator and air carriers shall maintain pilot records described in 49 U.S.C. § 44703(h)(1)(A) and (B) for a period of at least 5 years (see § 44703(h)(4)). The following records are required to be maintained:

(1) **Records Showing Compliance With PRIA.** To show that it has met the statutory requirements of 49 U.S.C. § 44703(h), each air carrier should have in place a records retention system that will allow the carrier and FAA to verify compliance with all PRIA requirements. Records received pursuant to PRIA requests should be maintained as follows:

(a) **Pilot Placed In Service.** Although the PRIA requires at least a 5-year retention period, an air carrier must be able to show that it complied with the provisions of the statute as long as the individual for whom the records pertain is in service as a pilot with such air carrier. Thus, the records required to be requested and received under 44703(h)(1)(A) and (B) for any pilot placed in service as a pilot by an air carrier on or after February 6, 1997, must be maintained by the air carrier:

1 as long as that pilot is in service as a pilot by such air carrier; and

2 for at least 5-years after the pilot terminates service with such air carrier.

(b) **Pilot Hired and Trained, but NOT Placed in Service.** The records described in 44703(h)(1)(A) and (B) that are compiled by the air carrier on a pilot during the training process, even if that pilot does not complete training and is not placed in service, are required to be maintained for at least 5 years.

NOTE: There are no statutory requirements to maintain records requested and received under the PRIA if the pilot is not hired as a pilot with the air carrier.

(2) Other Regulatory Requirements. The statutory requirement of 49 U.S.C. § 44703(h)(4) to maintain records identified by PRIA for at least 5 years is independent of any regulatory requirement addressing other time periods for maintaining records. For example, if a regulation requires that a certain record be maintained for only 2 years, and that record falls within the ambit of PRIA, then that record must be kept for at least 5 years to comply with PRIA.

e. Receipt Of Consent -- Provision Of Information (See 49 U.S.C. § 44703(h)(5)). A person furnishing a record in response to a request made under PRIA:

(1) Shall not furnish such records without first obtaining a copy of the written consent of the individual who is the subject of the records; and

(2) Shall furnish a copy of all such requested information not later than 30 days after receiving the request.

f. Pilot Right To Receive Notice And Copies of Records (See 49 U.S.C. § 44703(h)(6)). A person receiving a records request under PRIA must provide the individual who is the subject of the request:

(1) Within 20 days of receipt of the request, written notice of the request and of the individual's right to receive a copy of such records; and

(2) A copy of such records within a reasonable time, but not later than 30 days after the date of the request, if asked for [requested] by the individual.

g. Reasonable Charges For Processing Requests And Furnishing Copies. A person who receives a request for records under 49 U.S.C. § 44703(h)(1) or (6) may establish a reasonable fee for the cost of processing the request and furnishing copies of the records (see 49 U.S.C. § 44703(h)(7)).

(1) When the individual who is the subject of the records does not request a copy of the records, reasonable fees, if any, should be charged to the air carrier or person making the request.

(2) When the individual who is the subject of the records requests a copy of the records, reasonable fees, if any, should be charged separately to the person making the request and separately to the individual requesting a copy.

NOTE: Although a reasonable fee may be charged for providing records, those records MAY NOT be withheld until payment is made. Records must be provided within 30 days of receipt of the request (see 49 U.S.C. § 44703(h)(5) and § 44703(h)(10)).

h. Standard Forms.

(1) FAA Statutory Requirement. 49 U.S.C. § 44703(h)(8) requires the Administrator to promulgate standard forms that may be used by air carriers to request records. By using FAA standard forms and by following the specific instructions for those forms, an air carrier requesting pilot records may significantly expedite response time.

(2) Types of Standard Forms. There are four (4) forms that are required in order to comply with PRIA. Copies of the standard forms may be downloaded from the Internet at <http://www.faa.gov/avr/afs/pria/>. These forms are shown and explained in appendices 2 through 5 of this AC.

NOTE: FAA PRIA Forms 8060-10 and 8060-11 have been modified and any forms dated before 04/2003 are obsolete and may not be used. In addition, two (2) new FAA Forms [8060-10A and 8060-11A] have been promulgated to meet the statutory requirement of 49 U.S.C. § 44703(h).

(a) FAA Form 8060-10, FAA Records Request (PRIA) (see Appendix 2). FAA Form 8060-10 has a dual purpose and is used by:

- 1 An air carrier to request a pilot's FAA records; and
- 2 A pilot to give written consent for the release of his/her FAA records to the requesting air carrier.

NOTE: Requests for FAA records should be transmitted to the FAA by one of the means listed on FAA Form 8060-10 (see Appendix 2).

(b) FAA Form 8060-10A, Airman Notice And Right To Receive Copy -- FAA Records (PRIA) (see Appendix 3). FAA Form 8060-10A is a newly promulgated FAA Form that meets the statutory requirement of 49 U.S.C. § 44703(f). FAA Form 8060-10A is used by:

- 1 The FAA to notify the pilot of an FAA Records Request (PRIA) from an air carrier, and of the individual's right to receive a copy of the records furnished to the air carrier; and
- 2 The pilot to notify the FAA whether or not he/she wants a copy of the records furnished to the requesting air carrier.

(c) FAA Form 8060-11, Air Carrier and Other Records Request (PRIA) (see Appendix 4). FAA Form 8060-11 is used by:

- 1 An air carrier to request PRIA records from another *air carrier* or *person*; and
- 2 A pilot to give the requesting air carrier written consent for release of the PRIA records.

(d) FAA Form 8060-11A, Airman Notice And Right To Receive Copy – Air Carrier And Other Records (PRIA) (see Appendix 5). FAA Form 8060-11A is a newly promulgated FAA Form that meets the statutory requirement of 49 U.S.C. § 44703(f). FAA Form 8060-11A is used by:

1 The air carrier or person receiving a request for records to notify the pilot that a request for records has been made and that the pilot has the right to receive a copy of the requested records; and

2 The pilot to notify the requesting air carrier whether or not he/she wants a copy of the furnished records.

i. National Driver Register (NDR) Record Request -- Appendix 6.

(1) The National Highway Traffic Safety Administration (NHTSA) is responsible for administering the NDR portion of a record request under 49 U.S.C. § 44703(h). Requests for NDR records should be made directly to any state motor vehicle agency. NHTSA maintains an Internet database with current addresses and telephone numbers for State motor vehicle agencies that may be accessed at <http://www.nhtsa.dot.gov/people/perform/driver/>. A sample form that a State may use to request NDR information from the NDR is located in Appendix 4.

(2) Questions concerning NDR records may be addressed to:

National Highway Traffic Safety Administration
Attn.: National Driver Register (NTS-32)
400 7th Street, SW.
Washington, D.C. 20590
(202) 366-4800

j. Pilot Right To Correct Inaccuracies In Records. *Before making a final hiring decision with respect to the individual*, an air carrier that maintains, or requests and receives, the records of an individual under 49 U.S.C. § 44703(h)(1) shall provide the individual with a reasonable opportunity to submit written comments to correct any inaccuracies contained in the records (see 49 U.S.C. § 44703(h)(9)).

k. Pilot Right To Review Records. Unless there are other provisions of law or agreement to the contrary, a pilot has the statutory right to review his/her records (see 49 U.S.C. § 44703(h)(10)). Upon written request from a pilot *who is or has been employed* by such air carrier:

(1) The air carrier shall make available to the pilot for review, any and all employment records referred to in 49 U.S.C. § 44703(h)(1)(B)(i) or (ii) pertaining to the employment of the pilot; and

(2) The air carrier shall make available a copy of the aforementioned records to the pilot within a reasonable time, but not later than 30 days after the date of the request from the pilot.

l. Privacy Protections. The PRIA requires the privacy of the individual who is the subject of the records to be protected (see 49 U.S.C. § 44703(h)(11)). An air carrier that receives the records of an individual under 49 U.S.C. § 44703(h)(1):

(1) May use such records only to assess the qualifications of the individual in deciding whether or not to hire the individual as a pilot; and

(2) Shall take such actions as may be necessary to:

(a) Protect the privacy of the pilot;

(b) Protect the confidentiality of the records; and

(c) Ensure that information contained in the records is not divulged to any individual who is not involved in the hiring decision.

m. Special Rules With Respect To Certain Pilots (See 49 U.S.C. § 44703(h)(14)).

(1) **Pilots Of Certain Small Aircraft.** Before receiving the records required by 49 U.S.C. § 44703(h)(1), an air carrier may allow an individual to begin service for a period not to exceed 90 days as a pilot of an aircraft having a maximum payload capacity of 7,500 pounds or less (as defined in 14 CFR §119.3), or a helicopter, provided:

(a) The flight is not a scheduled operation (as defined in 14 CFR § 119.3);

(b) The air carrier obtains and evaluates the information required by 49 U.S.C. § 44703(h)(1) before the end of the 90-day period; and

(c) The contract between the air carrier and the individual contains a term that provides that the continuation of the individual's employment, after the last day of the 90-day period, depends on a satisfactory evaluation of any record received pursuant to a request under PRIA.

(2) **Good Faith Exception.**

(a) An air carrier may allow an individual to begin service as a pilot without obtaining information about the individual under 49 U.S.C. § 44703(h)(1)(B) from an air carrier or person that no longer exists; or, from a foreign government or entity that employed the individual, if the air carrier required to obtain the information has made a documented good faith attempt to obtain such information.

(b) Mail forwarded via the United States Postal Service (USPS) as "Certified, Return Receipt," may be considered as a documented good faith attempt. Similarly, mail forwarded

through either the USPS or a private carrier that provides a documented delivery of the request may also be considered as a documented good faith attempt to obtain such information.

NOTE: PRIA is silent on how long an air carrier must wait after making a documented good faith attempt for records and determining that no records are available. For air carriers that DO NOT fall within the exception at 49 U.S.C. 44703(h)(14), Special Rules With Respect To Certain Pilots, that time period must be longer than 30 days.

n. Electronic Access To FAA Records (See 49 U.S.C. § 44703(h)(15)).

(1) On April 5, 2000, PRIA was amended to allow designated individuals electronic access to FAA records. The electronic access to FAA records was coordinated with industry and is designed specifically for the purpose of increasing timely and efficient access to FAA records described in 49 U.S.C. § 44703(h)(1)(A). Under the revised statute, the Administrator may allow, under terms established by the Administrator, a designated individual to have electronic access to a specified database containing such records.

(2) The terms established by the Administrator shall limit such access to instances in which information in the database is required by the designated individual in making a hiring decision concerning a pilot applicant, and shall require that the designated individual provide assurances satisfactory to the Administrator that information obtained using such access will not be used for any purpose other than making the hiring decision.

NOTE: The FAA will provide further guidance on electronic access to FAA records prior to implementation.

o. Limitation On Liability (See 49 U.S.C. § 44703(i)(1)). No action or proceeding may be brought by or on behalf of an individual who has applied for or is seeking a position with an air carrier as a pilot and who has signed a release from liability, as provided for under 49 U.S.C. § 44703(i)(2), against:

(1) The air carrier requesting the records of that individual under 49 U.S.C. § 44703(h)(1);

(2) A person who has complied with such request;

(3) A person who has entered information contained in the individual's records; or

(4) An agent or employee of a person described in 49 U.S.C. § 44703(i)(1)(A) or (B), in the nature of an action for:

(a) Defamation;

(b) Invasion of privacy;

(c) Negligence;

(d) Interference with contract, or otherwise; or

(e) Under any Federal or State law with respect to the furnishing or use of such records in accordance with 49 U.S.C. § 44703(h).

p. Preemption (See 49 U.S.C. § 44703(i)(2)). No State or political subdivision thereof may enact, prescribe, issue, continue in effect, or enforce any law (including any regulation, standard, or other provision having the force and effect of law) that prohibits, penalizes, or imposes liability for furnishing or using records in accordance with 49 U.S.C. § 44703(h).

q. Provision Of Knowingly False Information (See 49 U.S.C. § 44703(i)(3)). Paragraphs (1) and (2) of 49 U.S.C. § 44703(i) shall not apply with respect to a person who furnishes information in response to a request made under 49 U.S.C. § 44703(h)(1) that:

(1) The person knows is false; and

(2) Was maintained in violation of a criminal statute of the United States.

r. Limitation On Statutory Construction (See 49 U.S.C. § 44703(j)). Nothing in 49 U.S.C. § 44703(h) shall be construed as precluding the availability of the records of a pilot in an investigation or other proceeding concerning an accident or incident conducted by the Administrator, the National Transportation Safety Board, or a court.

9. REQUESTS FOR RECORDS:

a. FAA Records. An air carrier request for FAA records should be made using **FAA Form 8060-10, FAA Records Request (PRIA)**. This form is available on the FAA PRIA website at <http://www.faa.gov/avr/afs/pria/>. The FAA will provide records reflecting current airman medical certificate and current airman certificates and associated type ratings, including any limitations to those certificates and ratings. The FAA will also conduct a search of the Enforcement Information System and provide a summary of legal enforcement actions resulting in a finding by the Administrator of a violation of Title 49 U.S.C. or a regulation prescribed or order issued under this Title that has not been subsequently overturned (as provided in 49 U.S.C. § 44703(h)(1)(A)(ii)).

b. Where To Send FAA Records Request. Requests for FAA records should be transmitted via one of the following means.

(1) Regular mail through the United States Postal Service (USPS):

Federal Aviation Administration
Attn.: Aviation Data Systems Branch, AFS-620 (PRIA)

PO Box 25082
Oklahoma City, OK 73125-0082

(2) Expedited mail service through USPS or private carrier:

Federal Aviation Administration
Attn.: Aviation Data Systems Branch, AFS-620 (PRIA)
6500 S. MacArthur Blvd., ARB Room 313
Oklahoma City, OK 73169

c. Where To Get Information Regarding FAA Records? All written or telephonic information requests and/or questions pertaining to FAA records may be transmitted via one of the following means:

(1) Telephonic Inquiries. Information concerning FAA records may be obtained by calling the FAA Aviation Data Systems Branch at (405) 954-0990.

(2) FAX Inquiries. Information concerning FAA records may be obtained by FAX from the FAA Aviation Data Systems Branch at (405) 954-4655.

(3) Written Inquiries. Written request for information concerning FAA records may be obtained by sending inquiries to the FAA Aviation Data systems Branch by one of the means listed in paragraph 9b above.

d. Requests For Air Carrier and Other Records. An air carrier request for air carrier and other records should be made using **FAA Form 8060-11, Air Carrier and Other Records Request (PRIA)**. This form is available on the FAA PRIA website at <http://www.faa.gov/avr/afs/pria/>. Requests should be submitted directly to the applicable air carrier or person that previously employed the individual at any time during the 5-year period preceding the date of employment application.

10. REQUEST FOR INFORMATION CONCERNING 49 U.S.C. § 44703(h).

a. Written and Telephonic Requests. All written or telephonic information requests and/or questions pertaining to 49 U.S.C. § 44703(h) should be addressed to:

NOTE: Do not mail FAA Records Requests (PRIA) to this address; use the address listed on FAA Form 8060-10 (see Appendix 2).

Federal Aviation Administration
Attn.: Air Transportation Division, AFS-200
800 Independence Avenue, SW.
Washington, D.C. 20591
(202) 267-8166

b. Internet.

(1) Additional information about PRIA may be obtained by contacting the person listed on the Flight Standards Service Internet Web Site at <http://www.faa.gov/avr/afs/pria/>

(2) Electronic copies of this AC and the standard forms may be downloaded from the internet at <http://www.faa.gov/avr/afs/pria/>.

/s/ John M. Allen, for
James J. Ballough
Director, Flight Standards Service

Appendix 1.
Pilot Records Improvement Act of 1996
Public Law 104-264, Section 502, October 9, 1996, (effective 02/06/97)
As Amended by:
Public Law 105-142 (effective 12/06/97);
Public Law 106-181(effective 04/05/00), and,
Public Law 107-71 (effective November 19, 2001)

Title 49 United States Code (49 U. S. C.) § 44703, as amended:

(h) RECORDS OF EMPLOYMENT OF PILOT APPLICANTS.

(1) IN GENERAL. Subject to paragraph (14), before allowing an individual to begin service as a pilot, an air carrier shall request and receive the following information:

(A) FAA RECORDS. From the Administrator of the Federal Aviation Administration, records pertaining to the individual that are maintained by the Administrator concerning--

(i) current airman certificates (including airman medical certificates) and associated type ratings, including any limitations to those certificates and ratings; and

(ii) summaries of legal enforcement actions resulting in a finding by the Administrator of a violation of this title or a regulation prescribed or order issued under this title that was not subsequently overturned.

(B) AIR CARRIER AND OTHER RECORDS. From any air carrier or other person, except a branch of the United States Armed Forces, the National Guard, or a reserve component of the United States Armed Forces, that has employed the individual as a pilot of a civil or public aircraft at any time during the 5-year period preceding the date of the employment application of the individual, or from the trustee in bankruptcy for such air carrier or person--

(i) records pertaining to the individual that are maintained by an air carrier (other than records relating to flight time, duty time, or rest time) under regulations set forth in--

(I) section 121.683 of title 14, Code of Federal Regulations;

(II) paragraph (A) of section VI, appendix I, part 121 of such title;

(III) paragraph (A) of section IV, appendix J, part 121 of such title;

(IV) section 125.401 of such title; and

(V) section 135.63(a)(4) of such title; and

(ii) other records pertaining to the individual's performance as a pilot that are maintained by the air carrier or person concerning--

(I) the training, qualifications, proficiency, or professional competence of the individual, including comments and evaluations made by a check airman designated in accordance with section 121.411, 125.295, or 135.337 of such title;

(II) any disciplinary action taken with respect to the individual that was not subsequently overturned; and

(III) any release from employment or resignation, termination, or disqualification with respect to employment.

(C) NATIONAL DRIVER REGISTER RECORDS. In accordance with section 30305(b)(8), from the chief driver licensing official of a State, information concerning the motor vehicle driving record of the individual.

(2) WRITTEN CONSENT; RELEASE FROM LIABILITY. An air carrier making a request for records under paragraph (1)--

(A) shall be required to obtain written consent to the release of those records from the individual that is the subject of the records requested; and

(B) may, notwithstanding any other provision of law or agreement to the contrary, require the individual who is the subject of the records to request to execute a release from liability for any claim arising from the furnishing of such records to or the use of such records by such air carrier (other than a claim arising from furnishing information known to be false and maintained in violation of a criminal statute).

(3) 5-YEAR REPORTING PERIOD. A person shall not furnish a record in response to a request made under paragraph (1) if the record was entered more than 5 years before the date of the request, unless the information concerns a revocation or suspension of an airman certificate or motor vehicle license that is in effect on the date of the request.

(4) REQUIREMENT TO MAINTAIN RECORDS. The Administrator and air carriers shall maintain pilot records described in paragraphs (1)(A) and (1)(B) for a period of at least 5 years.

(5) RECEIPT OF CONSENT; PROVISION OF INFORMATION. A person shall not furnish a record in response to a request made under paragraph (1) without first obtaining a copy of the written consent of the individual who is the subject of the records requested; except that, for the purposes of paragraph (15), the Administrator may allow an individual designated by the Administrator to accept and maintain written consent on behalf of the Administrator for records requested under paragraph (1)(A). A person who receives a request for records under this subsection shall furnish a copy of all of such requested records maintained by the person not later than 30 days after receiving the request.

(6) RIGHT TO RECEIVE NOTICE AND COPY OF ANY RECORD FURNISHED. A person who receives a request for records under paragraph (1) shall provide to the individual who is the subject of the records--

(A) on or before the 20th day following the date of receipt of the request, written notice of the request and of the individual's right to receive a copy of such records; and

(B) in accordance with paragraph (10), a copy of such records, if requested by the individual.

(7) REASONABLE CHARGES FOR PROCESSING REQUESTS AND FURNISHING COPIES. A person who receives a request under paragraph (1) or (6) may establish a reasonable charge for the cost of processing the request and furnishing copies of the requested records.

(8) STANDARD FORMS. The Administrator shall promulgate--

(A) standard forms that may be used by an air carrier to request records under paragraph (1); and

(B) standard forms that may be used by an air carrier to--

(i) obtain the written consent of the individual who is the subject of a request under paragraph (1); and

(ii) inform the individual of--

(I) the request; and

(II) the individual right of that individual to receive a copy of any records furnished in response to the request.

(9) RIGHT TO CORRECT INACCURACIES. An air carrier that maintains or requests and receives the records of an individual under paragraph (1) shall provide the individual with a reasonable opportunity to submit written comments to correct any inaccuracies contained in the records before making a final hiring decision with respect to the individual.

(10) RIGHT OF PILOT TO REVIEW CERTAIN RECORDS. Notwithstanding any other provision of law or agreement, an air carrier shall, upon written request from a pilot who is or has been employed by such carrier, make available, within a reasonable time, but not later than 30 days after the date of the request, to the pilot for review, any and all employment records referred to in paragraph (1)(B) (i) or (ii) pertaining to the employment of the pilot.

(11) PRIVACY PROTECTIONS. An air carrier that receives the records of an individual under paragraph (1) may use such records only to assess the qualifications of the individual in deciding whether or not to hire the individual as a pilot. The air carrier shall take such actions as may be necessary to protect the privacy of the pilot and the confidentiality of the records, including ensuring that information contained in the records is not divulged to any individual that is not directly involved in the hiring decision.

(12) PERIODIC REVIEW. Not later than 18 months after the date of the enactment of the Pilot Records Improvement Act of 1996 [enacted Oct. 9, 1996], and at least once every 3 years thereafter, the Administrator shall transmit to Congress a statement that contains, taking into account recent developments in the aviation industry—

(A) recommendations by the Administrator concerning proposed changes to Federal Aviation Administration records, air carrier records, and other records required to be furnished under subparagraphs (A) and (B) of paragraph (1); or

(B) reasons why the Administrator does not recommend any proposed changes to the records referred to in subparagraph (A).

(13) REGULATIONS. The Administrator shall prescribe such regulations as may be necessary--

(A) to protect--

(i) the personal privacy of any individual whose records are requested under paragraph (1) and disseminated under paragraph (15); and

(ii) the confidentiality of those records;

(B) to preclude the further dissemination of records received under paragraph (1) by the person who requested those records; and

(C) to ensure prompt compliance with any request made under paragraph (1).

(14) SPECIAL RULES WITH RESPECT TO CERTAIN PILOTS.

(A) **PILOTS OF CERTAIN SMALL AIRCRAFT.** Notwithstanding paragraph (1), an air carrier, before receiving information requested about an individual under paragraph (1), may allow the individual to begin service for a period not to exceed 90 days as a pilot of an aircraft with a maximum payload capacity (as defined in section 119.3 of title 14, Code of Federal Regulations) of 7,500 pounds or less, or a helicopter, on a flight that is not a scheduled operation (as defined in such section). Before the end of the 90-day period, the air carrier shall obtain and evaluate such information. The contract between the carrier and the individual shall contain a term that provides that the continuation of the individual's employment, after the last day of the 90-day period, depends on a satisfactory evaluation.

(B) **GOOD FAITH EXCEPTION.** Notwithstanding paragraph (1), an air carrier, without obtaining information about an individual under paragraph (1)(B) from an air carrier or other person that no longer exists or from a foreign government or entity that employed the individual, may allow the individual to begin service as a pilot if the air carrier required to request the information has made a documented good faith attempt to obtain such information.

(15) ELECTRONIC ACCESS TO FAA RECORDS. For the purpose of increasing timely and efficient access to Federal Aviation Administration records described in paragraph (1), the Administrator may allow, under terms established by the Administrator, an individual designated by the air carrier to have electronic access to a specified database containing information about such records. The terms shall limit such access to instances in which information in the database is required by the designated individual in making a hiring decision concerning a pilot applicant and shall require that the designated individual provide assurances satisfactory to the Administrator that information obtained using such access will not be used for any purpose other than making the hiring decision.

(i) LIMITATION ON LIABILITY; PREEMPTION OF STATE LAW.

(1) LIMITATION ON LIABILITY. No action or proceeding may be brought by or on behalf of an individual who has applied for or is seeking a position with an air carrier

as a pilot and who has signed a release from liability, as provided for under paragraph (2), against—

- (A) the air carrier requesting the records of that individual under subsection (h)(1);
 - (B) a person who has complied with such request;
 - (C) a person who has entered information contained in the individual's records;
- or

(D) an agent or employee of a person described in subparagraph (A) or (B); in the nature of an action for defamation, invasion of privacy, negligence, interference with contract, or otherwise, or under any Federal or State law with respect to the furnishing or use of such records in accordance with subsection (h).

(2) PREEMPTION. No State or political subdivision thereof may enact, prescribe, issue, continue in effect, or enforce any law (including any regulation, standard, or other provision having the force and effect of law) that prohibits, penalizes, or imposes liability for furnishing or using records in accordance with subsection (h).

(3) PROVISION OF KNOWINGLY FALSE INFORMATION. Paragraphs (1) and (2) shall not apply with respect to a person who furnishes information in response to a request made under subsection (h)(1), that--

- (A) the person knows is false; and
- (B) was maintained in violation of a criminal statute of the United States.

(j) LIMITATION ON STATUTORY CONSTRUCTION. Nothing in subsection (h) shall be construed as precluding the availability of the records of a pilot in an investigation or other proceeding concerning an accident or incident conducted by the Administrator, the National Transportation Safety Board, or a court.

APPENDIX 2. OVERVIEW OF FAA FORM 8060-10, FAA RECORDS REQUEST (PRIA)

NOTICE: Request will not be deemed received or valid unless Parts I and II are completed as specified in the instructions for the form.

1. **Part I – Records Request (PRIA).** Part I is used by the air carrier to request certain pilot records maintained by the Federal Aviation Administration (FAA). The FAA will provide records reflecting current airman medical certificate and current airman certificates and associated type ratings, including any limitations to those certificates and ratings. The FAA will also conduct a search of the Enforcement Information System and provide a summary of legal enforcement actions resulting in a finding by the Administrator of a violation of Title 49 U.S.C. or a regulation prescribed or order issued under this Title that has not been subsequently overturned (as provided in 49 U.S.C. § 44703(h)(1)(A)(ii)).

2. **Part II – Airman Consent to Release of Records.** Part II is used by the requesting air carrier to obtain written consent for the release of the records from the individual who is the subject of the records requested.

3. **Furnishing Records.** A person who receives a request for records under 49 U.S.C. § 44703(h) shall furnish a copy of all such requested records maintained by the person not later than 30 days after receiving the request.

4. **Reasonable Charges.** 49 U.S.C. § 44703(h)(7) allows for reasonable charges for processing requests and furnishing copies of requested records (see paragraph 8g above for further clarification).

5. **Mailing Address.** Requests for FAA records should be addressed as follows:

a. Regular mail through the United States Postal Service (USPS).

b. Expedited mail service through the USPS or private carrier.

Federal Aviation Administration
Attn.: Aviation Data Systems Branch,
AFS-620 (PRIA)
PO Box 25082
Oklahoma City, OK 73125-0082
(405) 954-0990
FAX (405) 954-4655

Federal Aviation Administration
Attn.: Aviation Data Systems Branch,
AFS-620 (PRIA)
6500 S. MacArthur Blvd., ARB Room 313
Oklahoma City, OK 73169
(405) 954-0990
FAX (405) 954-4655

FIGURE 1. FAA FORM 8060-10, FAA RECORDS REQUEST (PRIA) (FRONT)



 U.S. Department of Transportation Federal Aviation Administration	FAA RECORDS REQUEST (PRIA) Pilot Records Improvement Act Of 1996 Title 49 U.S.C. § 44703(h), Records of Employment of Pilot Applicants, As Amended
Requests for FAA records should be addressed as follows:	
Regular mail through the United States Postal Service (USPS). Federal Aviation Administration Attn.: Aviation Data Systems Branch, AFS-620 (PRIA) PO Box 25082 Oklahoma City, OK 73125-0082	Expedited mail service through the USPS or private carrier. Federal Aviation Administration Attn.: Aviation Data Systems Branch, AFS-620 (PRIA) 6500 S. MacArthur Blvd., ARB Room 313 Oklahoma City, OK 73169
NOTICE	
<p><i>Request will not be deemed received or valid unless Parts I and II are completed as specified in the instructions.</i></p> <p><i>Pursuant to 49 U.S.C. § 44703(h)(5), a person who receives a request for records under 49 U.S.C. § 44703(h)(1) shall furnish a copy of all such requested records maintained by the person not later than 30 days after receiving the request.</i></p>	
PART I: RECORDS REQUEST (PRIA)	
_____, _____, hereby requests records (Air Carrier Name) (Air Carrier Certificate #) pertaining to the airman consenting in Part II below concerning: (i) current airman medical certificate, current airman certificates and associated type ratings, including any limitations to those certificates and ratings, and (ii) summaries of legal enforcement actions resulting in a finding by the Administrator of a violation of Title 49 U.S.C. or a regulation prescribed or order issued under this Title that was not subsequently overturned (as provided by 49 U.S.C. § 44703(h)(1)(A)).	
Name: _____ (Print – Air Carrier Representative)	Title: _____ (Print—Title of Air Carrier Representative)
Signature: _____ (Air Carrier Representative)	Date: _____
Mailing Address: _____ _____ _____	
Telephone	FAX
PART II: AIRMAN CONSENT TO RELEASE OF RECORDS	
I, _____, consent to and authorize the Federal Aviation Administration (Print – Airman’s First, Middle, and Last Name)	
to release records concerning: (i) my current airman medical certificate, current airman certificates and associated type ratings, including any limitations to those certificates and ratings, and (ii) summaries of legal enforcement actions resulting in a finding by the Administrator of a violation by me of Title 49 U.S.C. or a regulation prescribed or order issued under this Title that was not subsequently overturned, to the air carrier named in Part I above.	
Airman Certificate Number(s): _____	
Signature: _____ (Not valid unless signed and dated)	Date: _____
*Mailing Address: _____	
*Denotes required information – see instructions #4	
Telephone: _____	
FAA Form 8060-10, FAA Records Request (PRIA), Revised 04/2003 – Previous editions are obsolete OMB No. 2120-0607	

FIGURE 1 (CONTINUED). FAA FORM 8060-10, FAA RECORDS REQUEST (PRIA) (BACK)

 <p>U.S. Department of Transportation Federal Aviation Administration</p>	<p>INSTRUCTIONS</p> <p>FAA FORM 8060-10, FAA RECORDS REQUEST (PRIA)</p> <p>Pilot Records Improvement Act Of 1996, Title 49 U.S.C § 44703(h), Records of Employment of Pilot Applicants, As Amended</p>
<p>Air carriers should use this form to request FAA Records from the Federal Aviation Administration.</p>	
<p>NOTICE</p> <p>Request will not be deemed received or valid unless Parts I and II are completed as specified below.</p> <p>This form may be photocopied for use. This form is available on the Internet at http://www.faa.gov/avr/afs/pria/. A separate form must be used for each airman whose records are requested. DO NOT enter information on this form such as date of birth, social security number, home address*, or other information in which the airman may have a reasonable expectation of privacy.</p>	
<p>Part I – FAA Records Request (PRIA): To be completed by the Air Carrier.</p>	
<p>NOTE: All entries, except for signature, must be either type written or printed legibly with black or dark blue ink.</p> <ol style="list-style-type: none"> 1. Name, title, and signature -- enter the name, title, and signature of the person making the request on behalf of the air carrier. 2. Date -- enter the date of the request. 3. Mailing address -- provide a complete company mailing address to which FAA will mail the requested records. 	
<p>Part II -- Airman Consent: To be completed by the Airman Applicant.</p>	
<p>NOTE: All entries, except for signature, must be either type written or printed legibly with black or dark blue ink.</p> <ol style="list-style-type: none"> 1. Name -- enter your name as it is shown on your airman certificate(s). 2. Airman Certificate Number -- enter your airman certificate number(s). In parenthesis after the certificate number, indicate the type of certificate by using S (Student), P (Private), C (Commercial), F (Flight Instructor), G (Ground Instructor), or A (Airline Transport Pilot). If you have multiple certificates with the same certificate number, list the certificate number once and indicate the types of certificates in parenthesis. For example, if you hold an Airline Transport Pilot Certificate as well as Flight Instructor and Ground Instructor Certificates using the same number, you should indicate as follows: Certificate No. 456231234 (A, F, G). 3. Signature and Date -- Sign in ink using your legal signature and enter the date. 4. *Mailing Address -- This information is required for the FAA to provide notice to the airman that a request for records has been received and of the airman's right to receive a copy of the records provided to the carrier. 	
<p>PAPERWORK REDUCTION ACT STATEMENT</p> <p>Title 49 United States Code (49 U.S.C.) § 44703(h), Records of Employment of Pilot Applicants, as amended, requires all air carriers to request FAA records and Air Carrier and Other Records concerning an individual before allowing that individual to begin service as a pilot. 49 U.S.C. § 44703(h)(8) requires the FAA Administrator to promulgate standard forms to request records. The information entered on the standard forms will be used to facilitate search and retrieval of the required records. It is estimated that the average burden per respondent associated with the collection of FAA Records [this collection] is 10 minutes. If you wish to comment on the accuracy of this estimate or submit suggestions for reducing the burden, you may write to: Federal Aviation Administration, Air Transportation Division, AFS-200, 800 Independence Avenue, SW, Washington, DC 20591. The requirement to collect background information on the pilots before allowing the pilot to begin service is mandatory; the use of this form is not. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The control number assigned to this collection is 2120-0607.</p>	

APPENDIX 3. OVERVIEW OF FAA FORM 8060-10A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY -- FAA RECORDS (PRIA)

Pilot Records Improvement Act Of 1996, As Amended

NOTICE: Request will not be deemed received or valid unless Parts I and II are completed as specified in the instructions for the form.

1. Part I – Airman Notice And Right To Receive Copy -- FAA Records (PRIA).

a. Part I is used by the FAA to notify the pilot of an FAA Records Request (PRIA) and of the pilot's right to receive a copy of the records furnished to the requesting air carrier.

b. The FAA will provide records reflecting current airman medical certificate, current airman certificates and associated type ratings, including any limitations to those certificates and ratings. The FAA will also conduct a search of the Enforcement Information System and provide a summary of legal enforcement actions resulting in a finding by the Administrator of a violation of Title 49 U.S.C. or a regulation prescribed or order issued under this Title that has not been subsequently overturned (as provided in 49 U.S.C. § 44703(h)(1)(A)(ii)).

2. Part II – Airman Request Or Non-Request For Records. Part II is used by the pilot to notify the FAA whether or not he/she wants a copy of the records that were furnished to the requesting air carrier.

3. Furnishing Records. A person who receives a request for records under 49 U.S.C. § 44703(h) shall provide to the individual who is the subject of the records:

a. On or before the 20th day following the date of receipt of the request, written notice of the request and of the individual's right to receive a copy of such records, and

b. Furnish a copy of all such requested records not later than 30 days after receiving the request.

4. Reasonable Charges. 49 U.S.C. § 44703(h)(7) allows for reasonable charges for processing requests and furnishing copies of requested records (see paragraph 8g above for further clarification).

FIGURE 1. FAA FORM 8060-10A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY -- FAA RECORDS (PRIA) (FRONT)



 U.S. Department of Transportation Federal Aviation Administration	AIRMAN NOTICE AND RIGHT TO RECEIVE COPY -- FAA RECORDS (PRIA) Pilot Records Improvement Act Of 1996 Title 49 U.S.C. § 44703(h), Records of Employment of Pilot Applicants, As Amended
NOTICE <i>Title 49 U.S.C. § 44703(h)(6) requires the person receiving a records request to notify the individual who is the subject of the request within 20 days after receiving the request, and further entitles the individual the right to receive a complete copy of all FAA records furnished in response to the request within 30-days after receiving the request.</i> <i>Title 49 U.S.C. § 44703(h)(7) allows for a reasonable charge for the cost of processing the request and furnishing copies of the requested records.</i>	
PART I: AIRMAN NOTICE AND RIGHT TO RECEIVE COPY	
(Airman Name – First, Middle, Last) Pursuant to 49 U.S.C. § 44703(h)(6), you are hereby notified that	(Airman Certificate #) _____ (Air Carrier Name) _____ _____, submitted an FAA Records Request (PRIA) dated _____,
(Air Carrier Certificate #) _____	(Date of Request) _____ for your records concerning: (i) current airman medical certificate, current airman certificates and associated type ratings, including any limitations to those certificates and ratings, and (ii) summaries of legal enforcement actions resulting in a finding by the Administrator of a violation of Title 49 U.S.C. or a regulation prescribed or order issued under this Title that was not subsequently overturned (as provided by 49 U.S.C. § 44703(h)(1)(A)). You are hereby notified of your right to receive a copy of any and all records furnished by the Federal Aviation Administration in response to the aforementioned records request, and that you may request a copy of such records by checking yes, signing, and dating in Part II below.
PART II: AIRMAN REQUEST OR NON-REQUEST FOR RECORDS	
<input type="checkbox"/> YES, I want a copy of the furnished records. <input type="checkbox"/> NO, I do not want a copy of the furnished records.	
Signature: _____ (Not valid unless signed and dated)	Date _____
*Mailing Address: _____ _____ _____	
*Denotes required information -- see instructions #3 Telephone: _____	
FAA Form 8060-10A, Airman Notice And Right To Receive Copy -- FAA Records Request (PRIA), 04/2003 OMB No. 2120-0607	

FIGURE 1. (CONTINUED) FAA FORM 8060-10A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY -- FAA RECORDS (PRIA) (BACK)

	INSTRUCTIONS FAA FORM 8060-10A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY -- FAA RECORDS (PRIA) Pilot Records Improvement Act Of 1996 TITLE 49 U.S.C § 44703(h), Records of Employment of Pilot Applicants, As Amended
	NOTICE Request will not be deemed received or valid unless completed as specified below. This form may be photocopied for use. This form is available on the Internet at http://www.faa.gov/avr/afs/pria/ A separate form must be used for each airman whose records have been requested. DO NOT enter information on this form such as date of birth, social security number, *home address, or other information in which the airman may have a reasonable expectation of privacy.
Part I: To be completed by the FAA Office receiving a FAA Records Request (PRIA). NOTE: All entries must be either type written or printed legibly with black or dark blue ink. 1. Airman's name and certificate number -- enter the name and certificate number of the individual who is the subject of the request on FAA Form 8060-10, FAA Records Request (PRIA). 2. Air carrier name and certificate number -- enter the name and certificate number of the air carrier making the request on FAA Form 8060-10, FAA Records Request (PRIA). 3. Date -- enter the date of the request listed on FAA Form 8060-10, FAA Records Request (PRIA).	
Part II: To be completed by Airman/Applicant. NOTE: All entries must be either type written or printed legibly with black or dark blue ink. 1. YES or NO -- check the appropriate box to indicate whether you DO or DO NOT want a copy of the records furnished. If requested, copies will be mailed to the mailing address provided. 2. Signature and date -- sign in ink using your legal signature and enter the date. 3. *Mailing address -- this information is required -- provide a complete mailing address to which the FAA will mail a copy of the requested records. 4. Return completed copy to FAA.	
<p align="center">PAPERWORK REDUCTION ACT STATEMENT</p> <p>Title 49 United States Code (49 U.S.C.) § 44703(h), Records of Employment of Pilot Applicants, as amended, requires all air carriers to request FAA records and Air Carrier and Other Records concerning an individual before allowing that individual to begin service as a pilot. 49 U.S.C. § 44703(h)(8) requires the FAA Administrator to promulgate standard forms to request records. The information entered on the standard forms will be used to facilitate search and retrieval of the required records. It is estimated that the average burden per respondent associated with the collection of FAA Records (this collection) is 10 minutes. If you wish to comment on the accuracy of this estimate or submit suggestions for reducing the burden, you may write to: Federal Aviation Administration, Air Transportation Division, AFS-200, 800 Independence Avenue, SW, Washington, DC 20591. The requirement to collect background information on the pilots before allowing the pilot to begin service is mandatory; the use of this form is not. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The control number assigned to this collection is 2120-0607.</p>	

**APPENDIX 4. OVERVIEW OF FAA FORM 8060-11, AIR CARRIER AND OTHER
RECORDS REQUEST (PRIA)**

Pilot Records Improvement Act Of 1996, As Amended

NOTICE: Request will not be deemed received or valid unless Parts I and II are completed as specified in the instructions for the form.

1. **Part I – Records Request (PRIA).** Part I is used by the air carrier to request certain records of the pilot from any air carrier or other person that has employed the individual at any time during the 5-year period preceding the date of the employment application of the individual, or from the trustee in bankruptcy for such air carrier or other person. The records that must be provided are identified in 49 U.S.C. § 44703(h)(1)(B) and paragraph 8a of this AC.

2. **Part II – Airman Consent to Release of Records.** Part II is used by the air carrier to obtain written consent to the release of the records from the airman who is the subject of the records requested.

3. **Furnishing Records.** A person who receives a request for records under 49 U.S.C. § 44703(h) shall furnish a copy of all such requested records maintained by the person not later than 30 days after receiving the request.

4. **Reasonable Charges.** 49 U.S.C. § 44703(h)(7) allows for reasonable charges for processing requests and furnishing copies of requested records (see paragraph 8g above for further clarification).

FIGURE 1. FAA FORM 8060-11, AIR CARRIER AND OTHER RECORDS REQUEST (PRIA) (FRONT)



 U.S. Department of Transportation Federal Aviation Administration	AIR CARRIER AND OTHER RECORDS REQUEST (PRIA)	
	Pilot Records Improvement Act Of 1996 Title 49 U.S.C. § 44703(h), Records of Employment of Pilot Applicants, As Amended	
NOTICE		
<i>Request will not be deemed received or valid unless Parts I and II are completed as specified in the instructions.</i>		
<i>Pursuant to 49 U.S.C. § 44703(h)(5), a person who receives a request for records under 49 U.S.C. § 44703(h)(1) shall furnish a copy of all such requested records maintained by the person not later than 30 days after receiving the request.</i>		
PART I: AIR CARRIER AND OTHER RECORDS REQUEST (PRIA)		
To: _____ _____ _____		
_____, _____, hereby requests (Air Carrier Name) (Air Carrier Certificate #)		
copies of records as required under 49 U.S.C. § 44703(h)(1)(B), as amended, pertaining to the airman consenting in Part II below.		
Name: _____ Title: _____ (Print - Air Carrier Representative) (Print—Title of Air Carrier Representative)		
Signature: _____ Date: _____ (Air Carrier Representative)		
Mail Records To: _____ _____ _____		
Telephone: _____ FAX: _____		
PART II: AIRMAN CONSENT TO RELEASE OF RECORDS		
I _____, consent to and authorize my current or previous (Print - Airman's First, Middle, and Last Name)		
employer _____ to release records (Print—Employer Name)		
pertaining to me as required under 49 U.S.C. § 44703(h)(1)(B) to the air carrier named in Part I above.		
Airman Certificate Number(s): _____ _____		
Signature: _____ Date: _____		
*Mailing Address: _____ _____ _____		
*Denotes required information -- see instructions #4		
Telephone: _____		
FAA Form 8060-11, Air Carrier And Other Records Request (PRIA), Revised 04/2003 - Previous editions are obsolete OMB No. 2120-0607		

FIGURE 1 (CONTINUED). FAA FORM 8060-11, AIR CARRIER AND OTHER RECORDS REQUEST (PRIA) -- PILOT RECORDS IMPROVEMENT ACT OF 1996, AS AMENDED (BACK)

 U.S. Department of Transportation Federal Aviation Administration	INSTRUCTIONS FAA FORM 8060-11, AIR CARRIER AND OTHER RECORDS REQUEST (PRIA), Pilot Records Improvement Act Of 1996 Title 49 U.S.C § 44703(h), Records of Employment of Pilot Applicants, As Amended
	Air carriers should use this form to request records from current and/or past employers as contemplated under 49 U.S.C. § 44703(h).
NOTICE Request will not be deemed received or valid unless Parts I and II are completed as specified below. Pursuant to 49 U.S.C. § 44703(h)(5), a person who receives a request for records under 49 U.S.C. § 44703(h)(1) shall furnish a copy of all such requested records maintained by the person not later than 30 days after receiving the request. This form may be photocopied for use. This form is available on the Internet at http://www.faa.gov/avr/afs/pria/ . A separate form must be used for each airman whose records are requested. DO NOT use this form to request Pilot Records from the Federal Aviation Administration.	
Part I: To be completed by the Air Carrier. NOTE: All entries, except for signature, must be either type written or printed legibly with black or dark blue ink. 1. To -- enter the address of the airman's current and/or previous employer. 2. Name, title, and signature -- enter the name, title, and signature of the person making the request on behalf of the air carrier. 3. Date -- enter the date of the request. 4. Mailing address -- provide a complete company mailing address to which the <i>air carrier</i> or <i>person</i> will mail the requested records.	
Part II: To be completed by Airman/Applicant. NOTE: All entries, except for signature, must be either type written or printed legibly with black or dark blue ink. 1. Name -- enter your name as it is shown on your airman certificate(s). 2. Airman Certificate Number -- enter your airman certificate number(s). In parenthesis after the certificate number, indicate the type of certificate by using S (Student), P (Private), C (Commercial), F (Flight Instructor), G (Ground Instructor), or A (Airline Transport Pilot). If you have multiple certificates with the same certificate number, list the certificate number once and indicate the types of certificates in parenthesis. For example, if you hold an Airline Transport Pilot Certificate as well as Flight Instructor and Ground Instructor Certificates using the same number, you should indicate as follows: Certificate No. 456231234 (A, F, G). 3. Signature and Date -- Sign in ink using your legal signature and enter the date. 4. *Mailing Address -- This information is required to provide notice to the airman that a request for records has been received and of the airman's right to receive a copy of the records provided to the carrier.	
PAPERWORK REDUCTION ACT STATEMENT Title 49 United States Code (49 U.S.C.) § 44703(h), Records of Employment of Pilot Applicants, as amended, requires all air carriers to request FAA records and Air Carrier and Other Records concerning an individual before allowing that individual to begin service as a pilot. 49 U.S.C. § 44703(h)(8) requires the FAA Administrator to promulgate standard forms to request records. The information entered on the standard forms will be used to facilitate search and retrieval of the required records. It is estimated that the average burden per respondent associated with the collection of Air Carrier and Other Records (this collection) is 30 minutes. If you wish to comment on the accuracy of that estimate or submit suggestions for reducing the burden, you may write to: Federal Aviation Administration, Air Transportation Division, AFS-200, 800 Independence Avenue, SW, Washington, DC 20591. The requirement to collect background information on the pilots before allowing the pilot to begin service is mandatory; the use of this form is not. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The control number assigned to this collection is 2120-0607.	

APPENDIX 5. OVERVIEW OF FAA FORM 8060-11A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY – AIR CARRIER AND OTHER RECORDS (PRIA)

Pilot Records Improvement Act Of 1996, As Amended

NOTICE: Request will not be deemed received or valid unless Parts I and II are completed as specified in the instructions for the form.

1. Part I – Airman Notice And Right To Receive Copy – Air Carrier And Other Records (PRIA). Part I is used by an *air carrier* or *person* that has employed the pilot at any time during the 5-year period preceding the date of the employment application to notify the pilot:

- a. That an Air Carrier And Other Records Request (PRIA) has been received, and
- b. To notify the pilot of the pilot's right to receive a copy of the records furnished to the requesting air carrier.


2. Part II – Airman Request Or Non-Request For Records. Part II is used by the Pilot to notify the *air carrier* or *person* whether or not he/she wants a copy of the records that were furnished to the requesting air carrier.

3. Furnishing Records. A person who receives a request for records under 49 U.S.C. § 44703(h) shall provide to the individual who is the subject of the records:

- a. On or before the 20th day following the date of receipt of the request, written notice of the request and of the individual's right to receive a copy of such records, and
- b. Furnish a copy of all such requested records not later than 30 days after receiving the request.


4. Reasonable Charges. 49 U.S.C. § 44703(h)(7) allows for reasonable charges for processing requests and furnishing copies of requested records(see paragraph 8g above for further clarification).

FIGURE 1. FAA FORM 8060-11A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY – AIR CARRIER AND OTHER RECORDS (PRIA) (FRONT)

 U.S. Department of Transportation Federal Aviation Administration	AIRMAN NOTICE AND RIGHT TO RECEIVE COPY – AIR CARRIER AND OTHER RECORDS (PRIA) Pilot Records Improvement Act Of 1996 Title 49 U.S.C. § 44703(h), Records of Employment of Pilot Applicants, As Amended
NOTICE	
<i>Title 49 U.S.C. § 44703(h)(6) requires the person receiving a records request to notify the individual who is the subject of the request within 20 days after receiving the request, and further entitles the individual the right to receive a complete copy of all air carrier and other records furnished in response to the request within 30-days after receiving the request.</i>	
<i>Title 49 U.S.C. § 44703(h)(7) allows for a reasonable charge for the cost of processing the request and furnishing copies of the requested records.</i>	
PART I: AIRMAN NOTICE AND RIGHT TO RECEIVE COPY	
<hr/>	
(Airman Name – First, Middle, Last)	(Airman Certificate #)
Pursuant to 49 U.S.C. § 44703(h)(6), you are hereby notified that _____,	
	(Air Carrier Name)
submitted an Air Carrier And Other Records Request (PRIA), dated _____,	
(Air Carrier Certificate #)	for your records as required under 49 U.S.C. § 44703(h)(1)(B), as amended.
(Date)	
You are hereby notified of your right to receive a copy of any and all records furnished by the Air Carrier or Person in response to the aforementioned records request, and that you may request a copy of such records by checking yes, signing, and dating in Part II below.	
PART II: AIRMAN REQUEST OR NON-REQUEST FOR RECORDS	
<input type="checkbox"/> YES, I want a copy of the furnished records. <input type="checkbox"/> NO, I do not want a copy of the furnished records.	
Signature: _____	Date _____
(Not valid unless signed and dated)	
*Mailing Address: _____	
*Denotes required information – see instructions #3 _____	

Telephone: _____	
FAA Form 8060-11A, Airman Notice And Right To Receive Copy – Air Carrier And Other Records Request (PRIA), 04/2003	
OMB No. 2120-0607	

FIGURE 1. (CONTINUED) FAA FORM 8060-11A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY – AIR CARRIER AND OTHER RECORDS (PRIA) (BACK)

 <p>U.S. Department of Transportation Federal Aviation Administration</p>	<p><u>INSTRUCTIONS</u></p> <p>FAA FORM 8060-11A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY -- AIR CARRIER AND OTHER RECORDS (PRIA)</p> <p>Pilot Records Improvement Act Of 1996 Title 49 U.S.C § 44703(h), Records of Employment of Pilot Applicants, As Amended</p>
<p>NOTICE</p> <p>Request will not be deemed received or valid unless completed as specified below.</p> <p>This form may be photocopied for use. This form is available on the Internet at http://www.faa.gov/avr/afs/pria/. A separate form must be used for each airman whose records are requested.</p>	
<p>Part I: To be completed by the <i>Air Carrier</i> or <i>Person</i> receiving the Air Carrier And Other Records Request (PRIA).</p> <p>NOTE: All entries must be either type written or printed legibly with black or dark blue ink.</p> <ol style="list-style-type: none"> 1. Airman's name and certificate number -- enter the name and certificate number of the individual who is the subject of the request on FAA Form 8060-11, Air Carrier And Other Records Request (PRIA). 2. Air carrier name and certificate number -- enter the name and certificate number of the air carrier making the request on Air Carrier And Other Records Request (PRIA). 3. Date -- enter the date of the request listed on FAA Form 8060-11, Air Carrier And Other Records Request (PRIA). 	
<p>Part II: To be completed by Airman/Applicant.</p> <p>NOTE: All entries must be either type written or printed legibly with black or dark blue ink.</p> <ol style="list-style-type: none"> 1. YES or NO—check the appropriate box to indicate whether you DO or DO NOT want a copy of the records furnished. If requested, copies will be mailed to the mailing address provided. 2. Signature and date—sign in ink using your legal signature and enter the date. 3. *Mailing address -- This information is required to provide notice to the airman that a request for records has been received and of the airman's right to receive a copy of the records provided to the carrier 4. Return completed copy to air carrier or person. 	
<p style="text-align: center;">PAPERWORK REDUCTION ACT STATEMENT</p> <p>Title 49 United States Code (49 U.S.C.) § 44703(h), Records of Employment of Pilot Applicants, as amended, requires all air carriers to request FAA records and Air Carrier and Other Records concerning an individual before allowing that individual to begin service as a pilot. 49 U.S.C. § 44703(h)(8) requires the FAA Administrator to promulgate standard forms to request records. The information entered on the standard forms will be used to facilitate search and retrieval of the required records. It is estimated that the average burden per respondent associated with the collection of FAA Records (this collection) is 10 minutes. If you wish to comment on the accuracy of this estimate or submit suggestions for reducing the burden, you may write to: Federal Aviation Administration, Air Transportation Division, AFS-200, 800 Independence Avenue, SW, Washington, DC 20591. The requirement to collect background information on the pilots before allowing the pilot to begin service is mandatory; the use of this form is not. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The control number assigned to this collection is 2120-0607.</p>	

APPENDIX 6. NATIONAL DRIVER REGISTER (NDR) RECORD REQUEST

1. Part I – NDR Record Request. The NDR Record Request is used by the air carrier to request NDR records about an individual seeking employment with the air carrier. Forms can be obtained from the State motor vehicle agency where the air carrier is located. The National Highway Traffic Safety Administration (NHTSA) maintains an Internet database with current addresses and telephone numbers for State motor vehicle agencies. This information may be accessed via the Internet at <http://www.nhtsa.dot.gov/people/perform/driver/>.

a. Probable Identification. The NDR will identify probable matches that require further inquiry for verification. It is strongly recommended that air carriers verify matches with State(s) of record.

b. Identification Information. Records received from the NDR will contain only identification information about the individual, provided by the State(s) that reported the information to the NDR. Specific information regarding the nature of the action that caused the individual to be listed on the NDR will not be provided. Such information should be requested by the air carrier from State(s) of record, after the air carrier verifies that the driver identified in the NDR record and the applicant are the same individual.

c. Period of Availability. Information will not be provided by the NDR if the information was reported to the NDR more than 5 years before the date of the request, unless the information relates to a suspension or revocation of driving privileges that is still in effect on the date of the request.

2. Part II - Consent to Request Records. Used to obtain written consent to the release of the records from the individual who is seeking employment with the air carrier. Requests will not be deemed received or valid if consent has not been provided.

a. To submit a request (with the consent) for the NDR check through a State chief driver licensing official, the individual must provide proof of identification in accordance with State procedures. Acceptable forms of identification may include a notarized signature or, if the consent is delivered by the individual in person, a driver's license, birth certificate, credit card, employee identification card, or other form of identification normally accepted by the State.

3. Part III – Notice to Prospective Employee. Serves as notice to prospective employees: (a) of the request; and (b) of their right to receive a copy of any records furnished by submitting a request for such records.

NOTE: Under the provisions of the Privacy Act, an individual may request his or her own report(s) at any time from the NDR office. An individual's own report will include all records on the individual and to whom they have been disclosed. States have different record retention requirements, e.g., 10 years. As a result, the individual's report will include anything the State has on file.

FIGURE 1. SAMPLE NATIONAL DRIVER REGISTER REQUEST

Name and Address of Air Carrier

PART I – NATIONAL DRIVER REGISTER (NDR) REQUEST

This request authorizes the National Highway Traffic Safety Administration (NHTSA) to perform a one-time file search of the National Driver Register (NDR) for information pertaining to me, and to provide the results to the prospective employer listed on this form. This search is to be limited to information about revocations or suspensions still in effect on the date of the request or information entered in the NDR in the past 5 years from the date of the request. Upon my request, the prospective employer listed shall make available to me any NDR information received as a result of this search.

Type or Print Clearly (Inquiries that cannot be read will be returned to the air carrier)

Full Legal Name (First, Middle, Last)

Other Names Used (Maiden, Prior Name, Nickname, Professional Name, Other)

Date of Birth (MM/DD/YYYY)

Social Security Number (Optional)

Driver's License Number and State

Sex

Eye Color

Height

Weight

PART II – CONSENT TO RELEASE RECORDS

Prospective Employee Understanding: I understand that the National Driver Register (NDR) search will result in a printed report which will be sent only to the prospective employer listed on this form. The report will indicate either: (1) that the NDR does not contain a record matching my identification; or, (2) that the NDR has a probable identification (pointer record) from one state (or more) which will be named on this report. A separate check of state files would be required: (1) to verify the identification; or, (2) to obtain the driving record. Under the Privacy Act, I have the right to request record(s) pertaining to me from the NDR to verify their accuracy.

I hereby, with my notarized signature, authorize a one-time file search of the NDR and any resulting reports to be sent to the prospective employer named on this form.

Signature _____

Date _____


PART III – NOTICE TO PROSPECTIVE EMPLOYEE

Pursuant to Title 49 United States Code § 44703(h), Records of Employment of Pilot Applicants, as amended, this serves as notice of a request for NDR information concerning your motor vehicle driving record and your right to receive a copy of such information.

Official Use Only		
Date Received	Date Sent	Internal control
Type of Identification		
! Valid Photo Driver License	! State-issued Photo ID	
! Birth Certificate	! Valid Passport	
! Valid Military ID	! Military discharge Papers	
! Other (specify) _____		
Employee Verifying Applicant Identification (Print Name)		Signature

NOTARIZATION
Required only if the NDR File Check Request is not made in person by the prospective employee.
Sworn to and ascribed before me this ____ day of _____
Stamp
20____ in the city/county _____
State of _____
Notary Public Seal or

APPENDIX 7. AUTHORIZATION FOR RELEASE OF DOT DRUG AND ALCOHOL TESTING RECORDS UNDER PRIA AND MAINTAINED UNDER TITLE 49 CODE OF FEDERAL REGULATIONS (49 CFR) PART 40

	AUTHORIZATION FOR RELEASE OF DOT DRUG AND ALCOHOL TESTING RECORDS UNDER PRIA AND MAINTAINED UNDER TITLE 49 CODE OF FEDERAL REGULATIONS (49 CFR) PART 40
Pilot Records Improvement Act Of 1996 Title 49 U.S.C. § 44703(h), Records of Employment of Pilot Applicants, As Amended	
Section I	
To be completed by the new employer, signed by the employee, and transmitted to the previous employer	
TO: _____ <small>Previous Employer, Name</small>	
_____ <small>City</small>	_____ <small>State</small>
I, _____ SSN: _____ have applied for employment <small>(Printed Name)</small>	
with _____, and hereby authorize <small>(Air Carrier Name - Printed)</small> <small>(Air Carrier Certificate Number)</small>	
release of records from Department of Transportation-regulated drug and alcohol testing of me by my previous	
employer, to _____ at this potential employer. This release <small>(Name of the person authorized to receive the release of these records - Printed)</small>	
is in accordance with DOT Regulation 49 CFR §40.25. I understand that information to be released by my previous employer is limited to the following DOT regulated testing records:	
<ol style="list-style-type: none"> 1. Alcohol test results indicating an alcohol concentration of 0.02 or greater; 2. Verified positive drug test results; 3. Documentation of refusals to take required alcohol and/or drug tests (including substituted or adulterated drug test results); 4. Substance Abuse Professional (SAP) reports; 5. All follow-up tests and schedules for follow-up tests; 6. Information obtained from previous employers under 49 CFR § 40.25 concerning drug and/or alcohol violations; and, 7. Records of negative and cancelled drug test results and alcohol test results with a concentration of less than 0.02. 	
Employee Signature: _____	Date: _____
A reproduction of this <u>authorization</u> shall be deemed effective and valid as an original.	
Applicants do not write below this line	
Section II	
Name of person providing the requested records: _____	
Title: _____	
Phone #: _____	
Date: _____	
NOTE To Previous Employer	
If the individual named in Section I above has requested a copy of their records pursuant to a PRIA records request on FAA Form 8060-11A, AIRMAN NOTICE AND RIGHT TO RECEIVE COPY -- AIR CARRIER AND OTHER RECORDS (PRIA), copies of the Drug and Alcohol records must be provided to the individual (Title 49 U.S.C. § 44703(h)(6)). Forward copies of the Drug and Alcohol records to the address provided by the individual on FAA Form 8060-11A.	

B

Chapter 4A: Flight Crewmember Ground Training Curriculum Segments

Segment I – Flight Crewmember Basic Indoctrination

14 CFR: 121.401(d) 121.403(b)(5) 121.415(a)(1)(i-iv) 121.415(a)(2)

Below is the complete course outline of Segment I, Basic Indoctrination, which includes the appropriate Subject Areas, Modules, and associated Elements.

Minimum Program Hours	Hours Required
• Initial New Hire Training	40
• *Recurrent Training	1
• Re-qualification Training	
– Up to 12 Months	1
– 12-35 Months	8
– 36 Months and longer	40

*Recurrent Basic Indoctrination is a review of all Company policy and procedures contained in Initial Basic Indoctrination that have changed throughout the preceding year.

Objective of Training

At the end of the basic indoctrination training curriculum segment the flight crewmember will understand Colgan Air, Inc., policies, procedures, and means of compliance with the Federal Aviation Regulations while engaged in the business of air commerce. Additionally, successful completion of this curriculum segment ensures the individual is fully prepared to enter aircraft ground and flight training. Recurrent Basic Indoctrination ensures that the crewmember remains adequately trained and currently proficient in Company policy and procedure.

Subject Areas

- Operator Specific
- Airman Specific

Revision: 29
Date: 20 Dec 07

COLGAN AIR



Crew Member and Dispatcher Training Program

Initial New Hire, Recurrent and Re-qualification Flight Crewmember Basic Indoctrination

14 CFR: 121.403(b)(1) 121.415(g)(2)
OPS SPEC: A027

Subject Areas and Module Titles

Operator Specific

- Duties & Responsibilities
- Appropriate Provisions of the Federal Aviation Regulations
- Contents of Certificate & Operations Specifications
- Portions of Operations Manual

Airman Specific

- System Operations Control
- Weight & Balance
- Aircraft Performance & Airport Analysis
- Meteorology
- Navigation
- Airspace & ATC Procedures
- Enroute & Terminal Area Charting & Flight Planning
- Concepts of Instrument Procedures
- Course Review and Examination

Subject Areas, Modules Titles with Elements

Operator Specific

- Duties & Responsibilities:
 - Company History, Organization, & Management Structure
 - Operational Concepts, Policies, & Kind of Operation
 - Company Forms, Records, & Administrative Procedures
 - Employee Standards & Rules of Conduct
 - Authority & Responsibilities of Duty Position
 - Company Required Equipment
 - Company Manual Organization, Revisions, & Employee Responsibilities with Manuals
- Appropriate Provisions of the Federal Aviation Regulations:
 - Flight Crewmembers Certification, Training, & Qualification Requirements
 - Medical Certificates, Physical Examination, & Fitness For Duty Requirements
 - Flight Control Requirements (Flight-Locating)



- Flight Duty & Rest Requirements
- Record Keeping Requirements
- Operational Rules in Part 61, 63, 91, 119 and Part 121 (As Appropriate) and Any Other Applicable Regulations
- Regulatory Requirements For Company Manuals
- Other Appropriate Regulations Such as Flight Crew Emergency Authority, Interference With Crewmembers, & Reporting Requirements
- Company Drug and Alcohol Testing Programs
- Exit Seating Requirements
- Carry on baggage program
- Minimum Equipment List (MEL)
- Contents of Certificate & Operations Specifications:
 - Regulatory Basis in Part 121 and Title 14 (As Amended)
 - Definitions, Description, & Organization of Operations Specifications
 - Limitations & Authorizations of Operations Specifications
 - Description of Certificate
 - Description of FAA Certificate Holding District Office & Responsibilities of FAA Principal Inspectors
 - Description of Manual Contents
- Portions of Operations Manual:
 - Flight Following Systems & Procedures
 - Organization, Duties, & Responsibilities
 - Company Communications
 - General Loading Procedures & Center of Gravity Computations
 - Effects of Fuel Burn & Load Shifts In Flight
 - Weather & NOTAM Information
 - Weight & Balance Forms, Load Manifests, & Other Applicable Documents
 - Maintenance coordination and Logbook procedures

Airman Specific

- System Operations Control:
 - Dispatch and Flight Locating
 - Organization, Duties and Responsibilities
 - Weather and NOTAM Information
 - Company Communications
- Weight & Balance:
 - Definitions (Such as Zero-Fuel Weight, Moments, % of MAC, LEMAC & Inches of Datum)
 - General Loading Procedures & Center of Gravity Computations
 - Effects of Fuel Burn & Load Shifts In Flight
 - Weight & Balance Forms, Load Manifests, Fuel Slips, & Other Applicable Documents

Revision: 29
Date: 20 Dec 07



Crew Member and Dispatcher Training Program

- Aircraft Performance & Airport Analysis:
 - Definitions (*Such As Balanced Field, VMC, Obstruction Planes, & Maximum Endurance*)
 - Effects of Temperature & Pressure Altitude
 - General TERPS Criteria (*Obstacle Clearance Standards*)
 - Airport Analysis System as Appropriate to the Type of Operation & Family or Families of Aircraft
 - Runway limitations for Takeoff and Landing including effects of Contaminated Runways
 - Land and Hold Short Operations
 - FAR 121 performance requirements
 - Wake Turbulence and Wake Turbulence Avoidance
- Meteorology:
 - Basic Weather Definitions (*Such as Forecasts, Reports, & Symbols*)
 - METAR's and TAF's
 - Temperature, Pressure, & Winds
 - Atmosphere Moisture & Clouds
 - Air Masses & Fronts
 - Thunderstorms, Icing, & Windshear
 - Reduced visibility including fog
 - Procedures for Recognizing and Avoiding Severe Weather including wind Shear
 - High Altitude Weather
- Navigation:
 - Definitions (*Such as Class I, Class II Navigation*)
 - Basic navigational Instruments
 - Dead Reckoning & Pilotage Concepts & Procedures
 - Navigational Aids
 - VHF, GPS (information only), & Self-Contained Systems (*As Applicable*)
- Airspace & ATC Procedures:
 - Definitions (*Such as Precision Approaches, Airways, & ATIS*)
 - Description of Airspace (*A, B, C, D, ... & G Classification*)
 - Navigation Performance & Separation Standards (VFR & IFR)
 - Controller & Pilot Responsibilities (VFR & IFR)
 - ATC Communications
 - Air Traffic Flow Control (VFR & IFR)
 - SWAP
- Enroute & Terminal Area Charting & Flight Planning:
 - Terminology of Charting Services (*Such as Jeppesen or NOAA*)
 - Take-Off Minimums, Landing Minimums, & Alternate Requirements
 - General Company Flight Planning Procedures
 - Flight Service & International Procedures (*As Applicable*)



- Airport Diagrams
- Airport Lighting and Markings
- Controlled Flight Into Terrain (CFIT): Training Aid & GPWS Escape Maneuver
- Concepts of Instrument Procedures Including Special Non CFR Part 97 Instrument Approach or Departure Procedures Described in OPS SPEC C081:
 - Definitions (Such as MDA, HAA, HAT, DH, CAT II ILS, & NOPT)
 - Holding Patterns, Procedure Turns
 - Precision Approaches (Such as CAT I)
 - Non-Precision Approaches
 - Circling, Visual, & Contact Approaches (As Applicable)
 - Visual cues before and during descent below DH or MDA
 - Approach Authorizations
 - Minimums (T/O, Alternate, etc.)
 - Special Instrument Approach or Departure Procedures

Course Review and Examination

Crew Member and Dispatcher Training Program

Flight Crewmember Aircraft Ground Training (DHC-8 Q400)

14 CFR: 121.403(b)(5) 121.419(b)(1)(ii) 121.427(a) 121.427(b)(1-2)
14 CFR: 121.427(c)(1)(ii)

Below is the complete course outline of Segment III, Aircraft Ground Training for the DHC-8 Q400 aircraft, which includes the appropriate Subject Areas, Modules, and associated Elements.

Minimum Program Hours	Hours Required
• Initial and Transition	80
• Upgrade Training	24
• Recurrent Training	16
• Re-qualification Training	-
-- Up to 12 Months	16
-- 12-35 Months	24
-- 36 Months and longer	80

Objective of Training

At the end of the Aircraft Ground Training Segment, the student will be able to locate, identify, and operate all aircraft systems. The student will be able to perform all normal operating procedures and selected abnormal and emergency procedures. Additionally, the student will be trained on how aircraft systems interrelate with respect to normal, abnormal, and emergency procedures. This training includes procedures as basic as those for powering the aircraft electrical and pneumatic systems with the GPU or as complex as those for programming computerized navigation and EFIS systems. Proper flight crew interaction in the use of checklists, crew resource management, and other operational procedures will be weighed upon heavily.

The pilot will be capable of satisfactorily completing the FAA/Company oral/written examination at the end of this Segment.

It is recognized that some duplication exists between the Initial Indoctrination and the General Subjects portion of Aircraft Ground Training. Any elements which are duplications need not be accomplished more than once or in more than one segment.

NOTE:

The DHC-8 Series has a common type rating and is applicable to the Series 100, 200, 300, and 400 airplanes. This approved program is for the 400 series only.

NOTE:

These curricula require completion of the Flight Management System Web Based training module prior to aircraft flight training. This additional self taught module (approximately 5-8 hours) is not included in the above required hours.

NOTE:

The above curricula include System Intergration Modules.



Crew Member and Dispatcher Training Program

CRM Training

14 CFR: 121.403(b)(5) 121.404 121.427(b)(4)

Below is the complete course outline of Segment VI, CRM Training

Minimum Program Hours	Hours Required
• Initial New Hire Training	8
• Upgrade	2
• Recurrent Training	2
• Re-qualification Training	
– Up to 12 Months	2
– 12-35 Months	4
– 36 Months and longer	8

Objective of Training

Upon completion of this program the trainee will be able to demonstrate knowledge:

General

This segment of training is identical for Flight Attendants (as applicable when Colgan Air operates larger type aircraft), Pilots and dispatchers (DRM). Therefore it is acceptable (and preferable) for both the categories of employees to receive the training simultaneously.

Subject Areas

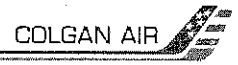
- General
- Review and Critique

Subject Areas and Modules**General**

- Definitions
- Situational Awareness
- Error Chain
- Leadership
- Role Playing
- Accident Case Studies

Review and Critique

Revision: 30
Date: 11 Apr 08



Crew Member and Dispatcher Training Program

Flight Crew Winter Operations / Anti-Ice / Deice

14 CFR: 121.403(b)(5)
OPS SPEC: A023

Below is the complete course outline of Segment IX, Winter Operations/Anti-ice/De-ice.

Minimum Program Hours	Hours Required
• Initial New Hire Training	2
• Recurrent Training	1
• Re-qualification Training	
– Up to 12 Months	1
– 12-35 Months	1
– 36 Months and longer	2

Objective of Training

Upon completion of this program the trainee will be able to demonstrate knowledge:

- In an awareness of the effects of snow/ice/frost contamination on aircraft performance and handling.
- In the proper procedures for ensuring the safe operation of aircraft during ground icing conditions.

General

No flight crewmember of Colgan Air will perform any assigned duties or responsibilities involving the Company's Anti-ice/De-ice program unless he or she has satisfactorily completed within the preceding 12 calendar months, the approved Company Winter Operations/ Training program outlined in the Company's approved Training Manual.

This course outline will be used for Initial New Hire, Recurrent and RE-QUALIFICATION training. During recurrent training a thorough review of all policy and procedures regarding Winter Operations will be accomplished. The difference in hours in the Initial vs. the Recurrent and RE-QUALIFICATION program is due only to the level of familiarity of the trainees. 3. This segment of training is identical for pilots and dispatchers. Therefore it is acceptable for both of the categories of employees to receive the training simultaneously.

Subject Areas

- The Use of Holdover Times
- Aircraft Deicing/Anti-Icing Procedures, Checks and Responsibilities
- Aircraft Surface Contamination, Critical Area Identification and Effect on Performance and Handling Characteristics
- Types, Purpose, Characteristics, and Effectiveness of Deicing and Anti-Icing Fluids
- Deicing/Anti-Icing Fluids Handling/Performance Implications

Crew Member and Dispatcher Training Program

- Fluid Specifications:
 - SAE and ISO Type I Deicing and Anti-icing Fluids
 - Monoethylene Glycol (EG)
 - Propylene Glycol (PG)
 - ISO 11075, Aerospace – Aircraft Deicing/Anti-Icing Newtonian Fluids ISO Type I
 - SAE and ISO Type II and IV Deicing and Anti-icing Fluids
 - Association of European Airlines (AEA)
 - United States Military Deicing Fluids
 - Other Deicing/Anti-icing Fluids

Deicing / Anti-Icing Fluids Handling / Performance Implications

- Increased rotation speeds/increased field length.
- Increased control (elevator) pressures on takeoff.
- Increased stall speeds/reduced stall margins.
- Lift loss during climbout/increased pitch attitude.
- Increased drag during acceleration/increased field length.
- Increased drag during climb.

Review and Examination

C



Chapter 7: Adverse Weather

Icing and Turbulence

Operating in Icing Conditions

14 CFR:	121.629(a)	121.629(b)	121.629(c)
CEME:	N4C	N4A	

Definitions

Icing Conditions on the Ground

(Operations on the ground, including the takeoff roll to the point of lift-off).

Icing conditions on the ground exist when the SAT is 10°C or below, and

- Visible moisture in any form is present (such as rain, snow, sleet, or ice crystals), or
- Fog is present with visibility of one mile or less, or
- When operating on areas where surface snow, ice, standing water, or slush may be ingested by the engines or freeze on the engines, nacelles, or engine sensor probes.

Icing Conditions in Flight

(After lift-off to landing)

Icing conditions exist in flight when the SAT is 5°C or below and visible moisture is present in any form.

Severe Icing Conditions

Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice buildup on protected surfaces, exceeding the capability of the ice protection system(s) or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems and may seriously degrade the performance and controllability of the airplane.

Severe icing conditions may be encountered during flight in visible rain with SAT below 0°C, and specifically with droplets that splash or splatter on impact.

Severe icing conditions may be identified by unusually extensive ice accreted on the airframe in areas not normally observed to collect ice, or ice accreted aft of the leading edge on the flight compartment side windows.

Aerodynamically Clean

The aircraft can be considered aerodynamically clean when all ice is removed from the visible leading edges and wing tips.

Ice Protection Definitions

Engine and Propeller

Icing conditions exist on the ground and for takeoff when SAT is 10°C or colder, and:

- The visibility is 1 mile or less with visible moisture in any form is present, e.g. clouds; fog, or
- Rain, snow, sleet, or ice crystals are present, or
- When operating on ramps, taxiways, or runways where surface snow, ice, standing water, or slush may be ingested by the engines or freeze on engines, nacelles, or engine sensor probes.

In Flight

Icing conditions exist during flight when SAT is 5°C or colder and:

- The visibility is 1 mile or less with visible moisture in any form is present, e.g. clouds; fog, or
- Rain, snow, sleet, or ice crystals are present.

REF SPEEDS Switch

The REF SPEEDS switch shall be placed in the INCR setting when in icing conditions, ice accretion visible or when the “Ice Detected” Advisory appears on the ED.

Airframe De-icing Boots

Icing conditions exist when:

- Ice accretion is visible, or
- “Ice Detected” Advisory appears on the ED.



Ice Protection Procedures

Required Equipment

The following ice protection equipment must be selected on:

Before takeoff in or into icing conditions,

Before entering icing conditions in flight,

When ice is detected or when flashing ICE DETECTED advisory appears on the ED (if equipment is not already on).

- WINDSHIELD HEAT selector (if required) – NORM

NOTE:

Except for operations in icing conditions or when required for defogging, windshield heat is not required in flight.

- PLT SIDE WDO/HT switch (if required) – ON
 - Select only if ice forms on the forward edge of Captain's side window.
- ENGINE INTAKE doors switches – Press
 - Check OPEN/HTR lights come on.
 - The OPN position shall be selected for the ENGINE INTAKE Anti-icing for all conditions, flight and ground, when OAT is below ISA + 25° C.
- Airframe De-icing Boots Operation

Ice accumulation shall be monitored to confirm that the appropriate airframe mode rate is selected. The AIRFRAME MODE SELECT selector must be operated in the FAST mode during takeoff above 1000' AGL, holds, approaches, or landings. SLOW mode can be selected during cruise. If the ice accumulation rate is at a point where the SLOW mode is unable to efficiently remove the ice, the FAST mode must be selected. When the Airframe De-ice boots on, monitor the advisory lights to ensure they illuminate sequentially in pairs for normal operation.

The AIRFRAME MODE SELECT selector can be turned OFF when the aircraft is aerodynamically clean, which is indicated when all ice is removed from the visible leading edges and wing tips.

- PROP selector – ON
 - Propeller de-ice system must be activated in icing conditions by selecting the PROPS selector to ON.
 - Verify PROP advisory lights illuminate and extinguish individually in sequence,
 - Observe the normal OIL temperature indication green arc on ED changes to 65°C to 107°C.
- REF SPEEDS Switch

The REF SPEEDS switch shall be placed in the INCR setting when in icing conditions, ice accretion visible or when the “Ice Detected” Advisory appears on the ED.

WARNING

REF SPEEDS Switch in INCR is prohibited below 1000’ AGL during takeoff.

WARNING

REF SPEEDS Switch shall not be changed below 1000’ AGL during landing.

CAUTION:

If airspeed is within 20 Knots of the Low Speed Cue, the airspeed must be increased before REF SPEEDS Switch is selected to INCR or a stall warning may occur.



The REF SPEEDS Switch may be selected OFF when the aircraft is no longer in icing conditions and the aircraft is aerodynamically clean, which is indicated when all ice is removed from the visible leading edges and wing tips.

CAUTION:

If VREF (not VREF (ICE)) is used for landing, the REF SPEEDS Switch must be selected OFF or a stall warning may occur at a speed higher than VREF.

NOTE:

Minimum oil temperature for takeoff into non-icing conditions is 0°C.

Minimum oil temperature for takeoff into icing conditions (below 1,500 AGL) is 55°C. Oil temperature indication on ED may be amber if below 65°C, but takeoff is authorized.

Minimum oil temperature for flight in icing conditions 3 minutes after takeoff is 65°C.

- Condition Levers – As Required

NOTE:

The effectiveness of the propeller deicing system can be improved and propeller vibration reduced by operation of the propellers up to 1020 NP.

The Condition Levers should be selected to MAX 1020 in icing conditions if:

- Moderate (or greater) icing conditions are encountered.
- Propeller vibration is noted.
- Ice from the propeller(s) begins to impact the side of the fuselage.

As soon as the icing conditions decrease, or are exited, the Condition Levers should be returned to MIN/850 for passenger comfort.

- DEICE PRESS indicator – Check
 - Verify 18 ±3 psi on each dial.

- REF SPEEDS Switch

The REF SPEEDS switch shall be placed in the INCR setting when in icing conditions, ice accretion visible or when the “Ice Detected” Advisory appears on the ED.

WARNING

REF SPEEDS Switch in INCR is prohibited below 1000’ AGL during takeoff.

WARNING

REF SPEEDS Switch shall not be changed below 1000’ AGL during landing.

CAUTION:

If airspeed is within 20 Knots of the Low Speed Cue, the airspeed must be increased before REF SPEEDS Switch is selected to INCR or a stall warning may occur.

The REF SPEEDS Switch may be selected OFF when the aircraft is no longer in icing conditions and the aircraft is aerodynamically clean, which is indicated when all ice is removed from the visible leading edges and wing tips.

CAUTION:

If VREF (Not VREF (ICE)) is used for landing, the REF SPEEDS Switch must be selected to OFF or a stall warning may occur at a speed higher than VREF.

NOTE:

To ensure deice pressure is maintained at 15 psi or greater during descent, holding and approach, it may be necessary to increase NL by advancing the Power levers.

- Use wing inspection and ice probe lights as required.

Additional Procedures during Climb (above Flap Retraction Altitude),
Cruise and Descent



On initial detection of ice:

- Minimum airspeed:
 - Climb (Flaps 0°) – $V_{CL} + 20$
 - Descent (Flaps 0° or 5°) – $V_{REF} + 20$
 - REF SPEEDS switch – INCR (above 1000 feet AGL)
 - Observe INCR REF SPEEDS advisory on ED.

CAUTION:

If airspeed is not increased before REF SPEEDS switch is selected to INCR, stick shaker(s) may activate.

- AIRFRAME MODE SELECT selector – FAST or SLOW, depending on the rate of ice accumulation
 - Monitor WING and TAIL deicer boot advisory lights for normal operation.
 - Check WING and TAIL advisory lights illuminate sequentially in pairs.

NOTE:

Monitor ice accumulation between boot cycles to confirm that the selected AIRFRAME AUTO rate (FAST or SLOW) is appropriate.

When using the wing inspection lights, the outboard boot area only, visible from the flight deck, is sufficiently illuminated for assessing ice accumulation.

CAUTION:

An accumulation of ice on the airplane may change the stall characteristics, stall speed, or warning margin provided by the stall warning system.

When out of icing conditions, the ICE DETECTED advisory disappears on the ED, ice accumulation is no longer detected and aircraft is aerodynamically clean:

- AIRFRAME MODE SELECT selector – OFF

- REF SPEEDS switch – OFF
- PROP SELECTOR – OFF
- Minimum Airspeed:
 - Flaps 0° or 5° – V_{CL}

Additional Procedures during Holding, Approach, and Landing in Icing Conditions

On initial detection of ice:

- AIRFRAME MODE SELECT selector – FAST
- REF SPEEDS switch – INCR
 - Observe INCR REF SPEEDS advisory on ED.
- Minimum Airspeeds with ice detected:
 - Holding – 190 to 200 KIAS
 - Descent (Flaps 0° or 5°) - $V_{REF} (ICE)$
 - Missed Approach and Go Around - $V_{GA}(ICE)$

NOTE:

Flaps must be set at 0° while holding in icing conditions.

WARNING

Minimum Airspeeds with ice detected are based on V_{REF} for the actual aircraft configuration, NOT the landing configuration V_{REF} , and may be considerably faster than the landing configuration V_{REF} . Slowing in reference to the landing configuration V_{REF} prior to configuring for landing may result in inappropriately slow airspeed and flight into the low speed cue or stick shaker.

Speed Bugs for Landing

V_{REF} , V_{GA} , $V_{REF} (ICE)$, and $V_{GA} (ICE)$ shall be obtained for every landing when icing conditions may be expected. The appropriate speeds must be set and briefed during the Approach Briefing:

Use V_{REF} - Whenever the REF SPEEDS Switch is OFF for landing

Use $V_{REF} (ICE)$ - Whenever the REF SPEEDS Switch is in INCR for landing.



Solid Blue Bug - VREF or VREF (ICE)

Open Blue Bug - VGA or VGA (ICE)

Ice Increments for VGA & VREF		
Flaps	VGA(ICE)	VREF(ICE)
15	VGA + 20	VREF + 20
35	-	VREF + 15

Figure 7-1: Ice Increments for VGA and VREF

When icing is no longer detected and the ICE DETECTED advisory disappears on ED:

- Minimum Airspeed – Maintain minimum airspeeds with ice detected until aircraft is aerodynamically clean.
- Monitor the left and right wing leading edges and wing tips.

If the aircraft is aerodynamically clean (no later than 1,000' AGL):

- REF SPEEDS switch – OFF
 - Check INCR REF SPEEDS advisory on ED is extinguished.
- Speed Bugs - Return to VREF and VGA
- AIRFRAME MODE SELECT selector – FAST or OFF
 - If in icing conditions – FAST
 - If not in icing conditions – OFF
- PROP selector – ON/OFF
 - If in icing conditions – ON
 - If not in icing conditions – OFF

After Landing

After flight in icing conditions an inspection of the engine intake is required if there is any ice adhering to the engine inlet, spinner, propeller or wing leading edge.

Ice Protection Levels

The proper response for any “Ice Protection” checklist item shall be the appropriate Ice Protection Level as listed below, however, the Ice Protection Level may be changed at anytime above 1000’ AGL. Any changes to the Ice Protection Level will be stated by both crewmembers.

Level One

For all flight conditions and on the ground

ENGINE INTAKE - OPN

PITOT/STATIC PORTS - STBY, 1, 2 (ON)

Level Two

Flight:

SAT 5°C or colder and visible moisture, or 1 mile visibility or less in clouds.

Ground Ops and Takeoff:

Surface snow, ice, standing water, or slush may be ingested by the engines or freeze on engines, nacelles, or engine sensor probes.

Level One items plus:

PROPS.....ON

WINDSHIELD HEAT.....NORM

SELECT REF SPEEDS Switch.....INCR(OFF for takeoff below 1000’ AGL.

WARNING

REF SPEEDS Switch in INCR is prohibited below 1000’ AGL during takeoff.

**WARNING**

REF SPEEDS Switch shall not be changed below 1000' AGL during landing.

CAUTION:

If airspeed is within 20 Knots of the Low Sped Cue, the airspeed must be increased before REF SPEEDS Switch is selected to INCR or a stall warning may occur.

The Ice Protection Level can return to Level 1 from Level 2 when the aircraft is no longer in icing conditions and the aircraft is dynamically clean, which is indicated when all ice is removed from the visible leading edges and wing tips.

Level Three

Ice accretion visible or when “Ice Detected” Advisory appears on ED.

Level One and Two items:

AIRFRAME MODE SELECT (De-ice Boots)

FAST during:

- Takeoff above 1000, AGL
- Holds
- Approaches
- Landings
- Cruise when SLOW Mode is insufficient to remove accumulated ice based upon rate of ice accretion.

SLOW During:

- Enroute Phases (cruise flight and climbs and descents during cruise) when SLOW Mode is sufficient to remove accumulated ice based upon rate of ice accretion.


The Ice Protection Level can return to Level 2 from Level 3 when the aircraft is aerodynamically clean, which is indicated when all ice is removed from the visible leading edges and wing tips.

ICE PROTECTION LEVELS			
LEVEL	1	2	3
DEFINITION	All Flight Conditions and on the Ground	<u>On Ground and Takeoff:</u> 10° C or colder with visible moisture, or 1 mile visibility or less with fog and when surfaces are contaminated. <u>During flight:</u> SAT 5° C or colder and visible moisture, or 1 mile visibility or less in clouds.	Ice accretion visible or when "Ice Detected" Advisory appears on ED
EQUIPMENT	<u>ENGINE INTAKE</u> - OPN <u>PITOT/STATIC PORTS</u> -STBY (ON) -1 (ON) -2 (ON)	<u>LEVEL ONE ITEMS</u> -ON <u>PROPS</u> - ON <u>WINDSHIELD HEAT</u> -NORM (OFF or WARMUP during ground ops) <u>REF SPEEDS</u> -INCR (OFF for takeoff below 1000' AGL)	<u>LEVEL TWO ITEMS</u> -ON <u>AIRFRAME MODE SELECT</u> -FAST <ul style="list-style-type: none"> • Takeoff above 1000' AGL • Holds • Approaches • Landings • Cruise -SLOW <ul style="list-style-type: none"> • Enroute Phases if sufficient to remove ice

Figure 7-2: Ice Protection Levels Chart

Q400 De-ice Checklist

De-ice Checklist must be used when configuring the aircraft for pre and post application checks to ensure the aircraft is properly configured for deice and then configured for takeoff following de-icing.



Q400 DE-ICE CHECKLIST

CAUTION:
 All de-icing will occur with the required takeoff flap position set.
 At NO TIME will an aircraft be de-iced with the APU running.
 At NO TIME will an aircraft be de-iced with any bleed air on.

Engines Shutdown De-Ice Checklist

NOTE: Accomplish all checklists up through and including the After Start.

When ready for de-ice:


GPU	ON	C
Cabin Announcement	Complete	C
AUTO-FEATHER	OFF	C
Complete parking checklist up through and including		
CONDITION LEVERS	FUEL OFF	C
DE-ICING	ACCOMPLISH	CR

When de-ice is complete:
 Check all controls for freedom of movement

AREA	CLEAR	CR
ENGINE START PROCEDURE	ACCOMPLISH	C
(BOTH ENGINES) (OBSERVE LIMITATIONS)		
AFTER START CHECKLIST	ACCOMPLISH	CR

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Figure 7-3: Q400 De-Ice Checklist, Page 1 of 3


Q400 DE-ICE CHECKLIST

Alternating Engines De-Ice Checklist

NOTE: Accomplish all checklists up through and including the After Start.

When ready for de-ice:

Cabin Announcement.....	Complete	C
BLEEDS #1 & #2	OFF	C
PTU/STBY PUMPS	OFF	C
AUTO-FEATHER OFF.....	OFF	C
CONDITION LEVER	START/FEATHER	C
Side to be diced first,		
CONDITION LEVER	FUEL OFF (30 SECONDS)	C

When first side de-ice is complete:

NOTE: Accomplish Engine start procedure prior to shutting down opposite engine.

AREA	CLEAR	CR
ENGINE START PROCEDURE	ACCOMPLISH	CR
	(ONE ENGINE) (OBSERVE LIMITATIONS)	

When de-ice is complete: Check all controls for freedom of movement

CONDITION LEVERS	MAX	C
AUTO-FEATHER	A/F SELECT	C
PTU/STBY PUMPS	ON	C
BLEEDS #1 & #2	ON	C
AFTER START CHECKLIST	ACCOMPLISH	C

Revision: Original
2 of 4
01/21/09

Figure 7-4: Q400 De-Ice Checklist, Page 2 of 3

Flight in Severe Icing (AD-99-19-18)

WARNING

Severe icing may result from environmental conditions outside of those for which the airplane is certificated. Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems and may seriously degrade the performance and controllability of the airplane. During flight, severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cues. If one or more of these visual cues exist, immediately request priority handling from ATC to facilitate a route or altitude change to exit icing conditions.

Unusually extensive ice accreted on the airframe in areas not normally observed to collect ice.

Accumulation of ice on the lower surface of the wing aft of the protected area.

Accumulation of ice on the propeller spinner farther aft than normally observed (farther than half way aft on the spinner).

Since the autopilot may mask tactile cues that indicate adverse changes in handling characteristics, use of the autopilot is prohibited when any of the visual clues specified above exist, or when unusual lateral trim requirements or autopilot trim warnings are encountered while the airplane is in icing conditions.

All icing detection lights must be operative prior to flight into icing conditions at night.

The following Weather Conditions may be Conducive to Severe in Flight Icing

- Visible rain at temperature below 0°C ambient air temperature.
- Droplets that splash or splatter on impact at temperature below 0°C ambient air temperature.

Procedures for Exiting the Severe Icing Environment

These procedures are applicable to all flight phases from takeoff to landing. Monitor the ambient air temperature. While severe icing may form at temperatures as cold as -18°C, increased vigilance is warranted at temperatures around freezing with visible moisture present. If the visual cues specified for identifying severe icing conditions are observed, accomplish the following.

- Immediately request priority handling from ATC to facilitate a route or an altitude change to exit the severe icing conditions. If necessary, the Captain may elect to declare an emergency to ensure priority handling.
- Avoid abrupt and excessive maneuvering that may exacerbate control difficulties.
- Do not engage the autopilot.
- If the autopilot is engaged, hold the control wheel firmly and disengage the autopilot.
- If an unusual roll response or uncommanded roll control movement is observed, reduce the angle of attack.
- Do not extend flaps during extended operation in icing conditions. Operation with flaps extended can result in a reduced wing angle of attack, with the possibility of ice forming on the upper surface further aft on the wing than normal, possibly aft of the protected area.
- If the flaps are extended, do not retract them until the airframe is clear of ice.

Report these conditions to ATC.

These procedures apply only to icing conditions encountered during flight; not forecast or reported icing conditions. These procedures are not intended to limit dispatch or landing in freezing precipitation, as these maneuvers result in relatively short exposure to the condition.

Specific Procedures Summary

If severe icing is encountered:

- Autopilot – Disengage immediately

CAUTION:

Be prepared for a possible roll force requirement by firmly holding the control wheel prior to disconnecting the autopilot.

- Ice Protection – ALL ON
- AIRFRAME DEICE – FAST
- Condition Levers – MAX 1020
- Power Levers – As required for maximum continuous power
- Minimum airspeed – 190 KIAS
- Exit icing conditions by changing altitude and/or course as required.

CAUTION:

Avoid aggressive maneuvering.

When clear of icing conditions:

NOTE:

It can be assumed that the airplane is no longer affected by the severe ice encounter when the ice accumulated on the flight compartment side window is removed. When visible, other surfaces, such as the propeller spinner and wing leading edges aft of the deicer boots, should also be used to confirm that the ice accumulated during the severe icing encounter has cleared.

- Power Levers and Condition Levers – Adjust as required
- Airspeed – As required
- Autopilot – As required

NOTE:

Prior to engaging the autopilot, ensure that in wings level steady state flight, there is no abnormal roll control force and the required lateral trim is appropriate for the aircraft configuration.

Adjustments to Performance After De/Anti-Icing

When the aircraft has been sprayed with Type I fluid mixed at more than 50% glycol, or with Type IV fluid, select FLUIDS in the FMS Takeoff Conditions menu options.

In all cases the climb, cruise, descent, approach and landing phases of flight are not affected by the use of de/anti-ice fluids.

Turbulence Penetration

CEME: N4E N4E1

Avoid Severe Turbulence

Careful preflight planning and aggressive in flight analysis using all available information must be done to avoid severe turbulence. Weather reports and PIREPs shall be analyzed to determine a course of action. The Captain shall avoid altitudes and routes where reports indicate the presence of severe turbulence.

The Captain will order the discontinuance of in flight passenger service prior to entering areas of known or expected moderate or greater turbulence.

Monitor Weather Radar

Carefully adjusting the radar for use is the key to having a picture that will help you circumnavigate storm cells. The weather radar, if operable, will be used in IMC conditions that include precipitation.

Before Entering Known Turbulence

- Seat belt Sign – ON. Consider discontinuing in flight passenger service and having the flight attendant secure the cabin.
- Determine best penetration altitude.
- Determine best penetration heading.

- Airborne weather radar provides the most accurate consistent information concerning the location of rain cells and should be relied upon for heading information up to 150 mile radar range.
- Beyond 150 miles, the U.S. Weather Bureau radar and pilot reports should be used.
- Provide reasonable minimum clearance around rain areas by selecting a heading which will clear the storm cells by:
 - 5 miles when OAT is 0°C or warmer
 - 10 miles when OAT is less than 0°C
 - 20 miles when at or above 23,000 feet

Establish Target Penetration Speed. (Maximum airspeed in rough air is 210 KIAS.)

Set Power to hold Target Speed:

- If necessary, use up to climb power to hold target speed. Do not “chase” airspeed and altitude in severe turbulence. Maintaining the power which gives target speed in smooth air will help minimize pitch changes and deviations in speed and altitude.

Attitude Becomes Primary:

- After setting power to the target speed, fly attitude. Attempt to maintain level flight with careful application of flight controls. Keeping the aircraft as close to the level attitude as possible is the most effective and safest method of flying in turbulence.

CAUTION:

Autopilot should not be used during severe turbulence.

If Severe Turbulence is Encountered

1. Cautiously adjust power as required to attain target speed. Keep large changes to a minimum.
2. Leave all trim tabs NEUTRAL.
3. Fly attitude.



Q400 Windshear Guidance

Turboprop Characteristics in Maximum Climb Conditions

Optimum aircraft performance (best angle of climb) occurs near $1.13 V_S$ for the aircraft configuration. Nominally, this speed equates to a target of V_2 (takeoff) or approximately V_{ref} (landing) for the flap configuration. Therefore, do not allow the airspeed to decrease below this speed.

It is not permissible in a turboprop to continue to increase pitch attitude until stick shaker occurs to maintain a maximum performance, sustainable climb. This is because stick shakers are AOA-based devices set to activate at $1.05 V_S$ at Idle Power. At high power settings the propeller slipstream creates additional lift on the airframe, which causes the stick shaker activation speed to decrease as power increases. Whereas this extra lift is an advantage for turboprops, there is a concern the aircraft could reach a dangerously low indicated airspeed if slowed to stick shaker activation. This is due to the following factors:

- At these very low airspeeds, the aircraft is operating on the extreme “back side” of the Lift/Drag curve with a significant deterioration of climb capability.
- Additionally, the airspeed can be significantly lower than VMCA, and so the flight controls may not retain sufficient authority to maintain control of the aircraft in turbulence or following an engine flameout.

Instead of referencing the stick shaker, Q400 turboprop aircraft are restricted to a minimum airspeed of V_2 (Takeoff) or V_{ref} (Landing) during windshear and GPWS recovery. These speeds are a natural choice since they are readily available to crewmembers and match optimal climb speed.

The Low Speed Awareness Cue in the Q400 is designed to overcome the limitations associated with the stick shaker, and always displays an appropriate minimum airspeed for aircraft control regardless of weight, flap or power setting. As a result, windshear recoveries can be flown using the low speed cue as an aid to preventing an unacceptable low airspeed condition.

Takeoff Preparations

Avoidance

The best defense against windshear is to avoid it altogether. This is especially important because shears will exist which are beyond the capability of any pilot or airplane. In most windshear accidents, several clues, LLWAS alerts, weather reports, and visual signs were present that would have alerted the flight crew to the presence of a windshear threat.

In all instances, however, these clues were either not recognized or not acted upon. Flight crews must seek and heed signs alerting them to the need for avoidance.

The importance of avoiding severe windshear and microbursts cannot be overemphasized. Avoidance may only involve delaying departure or approach for 10 to 20 minutes since this is the typical time required for microburst dissipation.

Unfortunately, there are no universal quantitative windshear avoidance criteria that provide unambiguous go/no-go decision guidelines. There is no assured detection and warning system in operation which can measure windshear intensity along a specific flight path. However, a summary of the weather evaluation factors which can be helpful in avoiding windshear is shown in the following table.

Table 7-1: Windshear Probability Table

MICROBURST WINDSHEAR PROBABILITY GUIDELINES	
OBSERVATION	PROBABILITY OF WINDSHEAR
PRESENCE OF CONVECTIVE WEATHER NEAR INTENDED FLIGHT PATH:	
• With localized strong winds (Tower reports or observed blowing dust, rings of dust, tornado-like features, etc.)	HIGH
• With heavy precipitation (Observed or radar indications of contour, red or attenuation shadow)	HIGH
• With rain shower	MEDIUM
• With lightning	MEDIUM
• With virga	MEDIUM
• With moderate or greater turbulence (reported or radar indications)	MEDIUM
• With temperature/dew point spread between 15 and 30 degrees Celsius	MEDIUM
ONBOARD WINDSHEAR DETECTION SYSTEM ALERT (Reported or observed)	HIGH
PIREP OF AIRSPEED LOSS OR GAIN	
• 15 knots or greater	HIGH
• Less than 15 knots	MEDIUM
LLWAS ALERT/WIND VELOCITY CHANGE	
• 20 knots or greater	HIGH
• Less than 20 knots	MEDIUM
FORECAST OF CONVECTIVE WEATHER	LOW

NOTE:

These guidelines apply to operations in the airport vicinity (within 3 miles of the point of takeoff or landing along the intended flight path and below 1000' feet AGL). The clues should be considered cumulative. If more than one is observed, the probability weighting should be increased. The hazard increases with proximity to the convective weather. Weather assessment should be made continuously.

The preceding table, designed specifically for convective weather (thunderstorm, rain shower, virga), provides a subjective evaluation of various observational clues to aid in making appropriate real time avoidance decisions. The observation weighting is categorized according to the following scale:

HIGH PROBABILITY: Critical attention need be given to this observation. A decision to avoid (that is, divert or delay) is appropriate.

MEDIUM PROBABILITY: Consideration should be given to avoiding. Precautions are appropriate.

LOW PROBABILITY: Consideration should be given to this observation, but a decision to avoid is not generally indicated.

Should the avoidance process fail, some key points to keep in mind are summarized as follows:

Windshear Recognition

- Recognition of windshear encounter is difficult and is usually complicated by marginal weather
- Time available for recognition and recovery is short (as little as 5 seconds)
- Flight crew coordination is essential for prompt windshear recognition and recovery

Pilot Technique

- Flight path must be controlled with pitch attitude (unusual stick forces may be required as a result)
- Lower than normal airspeed may have to be accepted to counter altitude loss



Takeoff Precautions

Do not use a reduced power takeoff; use normal takeoff power if there are any reports of wind-shear in the area. Use the longest suitable runway, provided it is clear of areas of unknown windshear. Be alert for airspeed fluctuations during takeoff and initial climb. Airspeed fluctuations may be the first indication of windshear. Rotate at the normal pitch rate to the normal takeoff pitch attitude. Minimize reductions from this initial attitude until terrain and obstacle clearance is assured.

If windshear is not encountered:

- Rotate normally. When airborne after rotation, establish the airspeed at V_2 .
- Maintain takeoff flap configuration, power setting, and V_2 until clear of suspected windshear, then continue with the normal climb profile.

If windshear is encountered, call “**Windshear**” and:

- Prior to V_1 , abort takeoff.
- After V_1 ,
 - Accelerate to and rotate normally at V_r .
 - If 2,000' of usable runway remaining is reached before obtaining VR:
 - Rotate normally, even if below V_r . Follow Takeoff Procedures. Windshear/GPWS Recovery Procedures.
 - If required to establish climb or clear obstacles, call “**Max Power**” and advance power past detent to full travel.
 - Rotate normally, even if below V_r . Follow Takeoff Procedures. Windshear/GPWS Recovery Procedures.
 - If required to establish climb or clear obstacles, call “**Max Power**” and advance power past detent to full travel.

NOTE:

If practical, observe MAX Torque transient limits; however, obtaining safe climb and obstacle clearance takes precedence over transient limits.

Approach Preparations

When windshear weather analysis or PIREPS indicates that a loss of airspeed will be experienced on an approach, the PF will adjust Vref in relation to the reported loss in the same manner as a gust correction.

The windshear adjustment should not exceed Vref + 20 knots. If the expected loss of airspeed exceeds 20 knots, the approach should be delayed until conditions improve.

Increased airspeed on approach improves climb performance capability and reduces the potential for flight at stick shaker during recovery from an inadvertent windshear encounter.

If windshear is encountered, follow Windshear/GPWS Recovery Procedures.

Actual Windshear Encounter on Approach

WINDSHEAR/GPWS RECOVERY - PROCEDURES

	PILOT FLYING	PILOT MONITORING
PITCH	Call "Windshear" or "GPWS" • Depress GA button (Wings Level – GA) on POWER Lever. • Rotate to Flight Director GA command bar (10° if Flight Director not available.)	Position hands below POWER Levers to assist power applications and protect torque limits.
POWER	After initiating rotation: Call " Check power " and advance POWER Levers to detent.	Monitor torque indicators. Ensure POWER Levers set to detent.
If Windshear is Encountered or GPWS Escape is Required: Do not change gear or flap configuration until stabilized climb is established. NTOP power and 10° pitch generally provide sufficient performance to establish climb.		

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P I T C H	If aircraft is descending or GPWS warning continue, increase pitch to maintain:	Monitor airspeed, VSI, and radar altimeter:
	<ul style="list-style-type: none"> • V_2 • V_{ga} 	<ul style="list-style-type: none"> • If descent is noted, call “Sink Rate,” • If airspeed deteriorates below target airspeed, call “Airspeed.”
	DO NOT SLOW TO STICK SHAKER!	
If Stick Shaker Occurs or Airspeed Tape Turns Red:		
	Immediately reduce pitch attitude to silence shaker and achieve an airspeed above the low speed cue. When able, adjust pitch to return to target airspeed.	

P O W E R	If Below 500' AGL and Necessary to Avoid Ground Contact:	
	Call “ Max power ” and advance power past detent to full travel.	<p>If radar altimeter indicates below 500' AGL, call “500 feet.”</p> <p>Verify POWER Levers set to maximum forward travel.</p>

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If Ground Contact is Imminent:	
Increase pitch to trade airspeed for altitude to just above stick shaker to arrest descent. When able, adjust pitch to return to target airspeed.	
After Stabilized Climb is Established:	
When climb is established and clear of obstacles, reduce pitch to 10° and power back to detent then call “Check Power” OR “Check Power, Flaps 15” if a Flaps 35 approach was used.	If Flaps 35 was used, retract the Flaps to 15. Verify POWER Levers returned to detent.
	When a positive rate of climb is noted, call “Positive Rate.”
Verify positive rate of climb and call “Gear Up.”	Move the Lock-release aside and place the Gear Handle to the UP position.
In a timely manner after the Gear is selected up call “Heading, ALT SEL.”	Select HDG and ALT SEL on the FGCP.
Upon reaching 1000' and clear of obstacles call “Flaps 0, Set IAS ___, Climb Checklist.” The recommended speed to set is 200 knots until 2500 feet MSL at which time a higher airspeed may be used.	Upon reaching V _{FRI} call “V_{FRI}”

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		Retract the flaps, set commanded IAS, perform the Climb Flow, silently complete the Climb Checklist, and then call “Climb Checklist Complete.”
Comply with MISSED APPROACH CLEARANCE		

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2.15.7.19 ICE PROTECTION PROCEDURES

TAKE-OFF IN OR INTO ICING CONDITIONS

PRE TAKE-OFF CHECKS:

ENGINE INTAKE DOORS switches Press
Check OPN/HTR advisory lights illuminate.

WINDSHIELD HEAT:

WINDSHIELD HEAT selector NORM

DEICE PRESS indicator Check 18 ± 3 psi on Each Dial

PROP selector ON

Observe PROPS advisory lights illuminate individually and go out in sequence and the normal operating (green arc) on the oil temperature indication on ED changes to 65 to 107 °C.

NOTE: To ensure engine air inlet ice protection, it is acceptable to set take-off power with a ... with a minimum oil temperature of 55 °C (OIL temperature indication on ED in the yellow arc). Oil temperature must reach 65 °C or greater (OIL temperature indication on ED in the green arc) within 3 minutes after take-off power is set.

AFTER TAKE-OFF:

At 400 ft AGL, commencement of Third Segment:

Increase Airspeed to VCLIMB +20 kts.

FLAPS Lever 0° at VFRI

At flap retraction initiation speed flap 5° and 10° or flap 15°.

REF SPEEDS INCR

Check [INCR REF SPEED] appears on ED.

CAUTION

If airspeed is not increased before REF SPEEDS switch is set to INCR, stall warning may occur.

At 400 ft AGL, continuation of Second Segment:

Airspeed Increase

Increase airspeed to V2 +20 kts (Flaps 5°, 10° and 15°).

REF SPEEDS switch INCR

Check [INCR REF SPEED] appears on ED.

CAUTION

If airspeed is not increased before REF SPEEDS switch is set to INCR, stall warning may occur.

On initial detection of ice:

AIRFRAME Mode Selector Fast

At commencement of third segment:

Increase Airspeed to VCLIMB + 20 kt

FLAPS Lever 0° at VFRI

At flap retraction initiation speed flap 5° and 10° or flap 15° + 20 kt.

(cont'd on next page)



ICE PROTECTION PROCEDURES (cont'd)

INFLIGHT:

BEFORE ENTERING ICING CONDITIONS OR WHEN ICE IS DETECTED OR WHEN FLASHING "ICE DETECTED" ADVISORY APPEARS ON ED.

ENGINE INTAKE door switches Press
Check OPN/HTR advisory lights illuminate.

PROP selector ON
Observe PROPs advisory lights illuminate individually and go out in sequence and the normal operating (green arc) on the oil temperature indication on ED change to 65 to 107 °C.

NOTE: The effectiveness of the propeller de-icing system can be improved and propeller vibration reduced by operation of the propellers at 1020 rpm.

REF SPEEDS switch INCR
Check [INCR REF SPEED] appears on ED.

WINDSHIELD HEAT selector NORM
If ice forms on the forward edge of pilot's side window:

PLT SIDE WDO/HT switch On
DEICE PRESS indicator Check 18 ± 3 psi on Each Dial

NOTE: To ensure de-ice pressure is maintained at 15psi or greater during descent, holding and approach, it may be necessary to increase N_L by advancing POWER levers.

CLIMB, CRUISE AND DESCENT IN ICING CONDITIONS

On initial detection of ice:

- Minimum airspeed:
 - a. Climb - Final Take-off Climb Speed + 20 kts.
 - b. Descend - 1.23 V_{SR} flap 0° + 25 kts.

AIRFRAME MODE SELECT selector FAST or SLOW
Depending on the rate of ice accumulation. Check WING and TAIL advisory lights illuminate sequentially in pairs.

NOTE: Monitor ice accumulation between boot cycles to confirm that the selected AIRFRAME MODE rate (FAST or SLOW) is appropriate. When using the wing inspection lights, the inboard boot area only, visible from the flight deck, is sufficiently illuminated for assessing ice accumulation.

CAUTION

An accumulation of ice on the aeroplane may change the stall characteristics, stall speed, or warning margin provided by the stall warning system.

Monitor WING and TAIL advisory lights for normal operation.

When ice accumulation is no longer detected and the ICE DETECTED advisory disappears on the ED and all ice is removed from the visible leading edges:

AIRFRAME MODE SELECT selector OFF
(cont'd on next page)

ICE PROTECTION PROCEDURES (cont'd)

When the aircraft is aerodynamically clean:

NOTE: The aircraft can be considered aerodynamically clean when all ice is removed from the visible leading edges and wing tips.

REF SPEEDS switchOFF

Check [INCR REF SPEED] disappears on ED.

Minimum airspeed 1.23 V_{SR} flap 0° or Approach and V_{REF} flap 5°, 10° and 15°.

HOLDING, APPROACH AND LANDING IN ICING CONDITIONS (Ice Protection Systems "ON"):

NOTE: When holding in icing conditions flap must be at 0°.

On initial detection of ice:

- Increase Speeds and Landing Field Length as follows:

FLAPS	V _{APP}	V _{GA}	V _{REF}	LFL	HOLDING
0°	+25 kts	+20 kts	+25 kts	-	190 kts MIN
5°	+20 kts	+20 kts	+20 kts	-	-
10°	+20 kts	+20 kts	+20 kts	+25%	-
15°	+20 kts	+20 kts	+20 kts	+25%	-
35°	-	-	+15 kts	+20%	-

AIRFRAME MODE SELECT selector..... FAST

Check WING and TAIL advisory lights illuminate sequentially in pairs.

HOLDING, APPROACH AND LANDING AFTER FLIGHT IN ICING CONDITIONS OR ICING IS NO LONGER DETECTED AND THE ICE DETECTED ADVISORY DISAPPEARS ON ED

Minimum airspeed as above (Holding, Approach and Landing in Icing Conditions).

Continue to cycle boots on FAST until all ice is removed from visible leading edges.

When all ice is removed from visible leading edges:

AIRFRAME MODE SELECT selector.....OFF

NOTE: The aircraft can be considered aerodynamically clean when all ice is removed from the visible leading edges and wing tips.

When the aircraft is aerodynamically clean:

REF SPEEDS switchOFF

Minimum Speed Vref



ICE PROTECTION PROCEDURES (cont'd)

FLIGHT IN SEVERE ICING

Autopilot.....Disconnect immediately

CAUTION

Be prepared for a possible roll force requirement by firmly holding the control wheel prior to disconnecting the autopilot.

Condition leversMAX / 1020

POWER levers Adjust to MCP

Minimum speed190 kt IAS

Exit severe icing conditions by changing altitude and/or course as required.

CAUTION

Avoid aggressive maneuvering.

When clear of severe icing conditions:

NOTE: It can be assumed that the airplane is no longer affected by the severe ice encounter when the ice accumulated on the flight compartment side window is removed. When visible, other surfaces, such as the propeller spinner and wing leading edges aft of the de-icer boot, should also be used to confirm that the ice accumulated during the severe icing encounter has cleared.

POWER levers and Condition levers Adjust As Req'd

Airspeed As Req'd

Autopilot..... As Req'd

CAUTION

Prior to engaging the autopilot, ensure that in wings level steady state flight, there is no abnormal roll control force and the required lateral trim is appropriate for the aircraft configuration.

| Refer to page 2.15-70 as appropriate, for holding, approach and landing.

If it cannot be determined that the aircraft is no longer affected by the severe icing encounter:

| Refer to page 2.15-70 for holding, approach and landing.

Do not engage autopilot.

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