



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

December 22, 2021

Group Chairman's Factual Report

OPERATIONAL FACTORS

DCA19FA089

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A. ACCIDENT

Operator: CommutAir
Location: Presque Isle, Maine
Date: March 4, 2019
Time: 1129 EST
Airplane: Embraer E145, N14171

B. OPERATIONAL FACTORS GROUP

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C. SUMMARY

On March 4, 2019, at 1129 eastern standard time, CommutAir flight 4933, an Embraer EMB-145XR, N14171, d.b.a. United Express, landed between runway 1 and taxiway A in moderate snow at Northern Maine Regional Airport at Presque Isle (PQI), Presque Isle, Maine. This was the second approach to runway 1 after having conducted a missed approach during the first approach. Radar track data show that the airplane was aligned right of runway 1 during both approaches. Of the 31 passengers and crew onboard, two passengers and one crewmember received minor injuries. The airplane was substantially damaged. The flight was operating under the provisions of Title 14 Code of Federal Regulations Part 121 as a regularly scheduled domestic passenger flight from Newark International Airport (EWR), Newark, New Jersey, to PQI.

¹ Nick Biondo replaced Cory Hamernik as the ALPA group member in May of 2019.

D. DETAILS OF THE INVESTIGATION

On March 7, 2019, the group conducted telephone interviews with the captain and first officer (FO) for the flight.

On May 20 and 21, 2019, the group traveled to CommutAir headquarters in North Olmsted, Ohio, and conducted interviews with the vice-president of flight operations, the director of operations, the director of flight operations training, the chief pilot, the managing director of safety, the safety program manager, and the manager for regulatory compliance / FOQA² manager.

Flight documents and company manuals were obtained from CommutAir. Flight crew certification and oversight records were obtained from the FAA.

E. FACTUAL INFORMATION

1.0 History of the Flight

The captain stated she had an 0800-report time the day of the accident. The FO stated the report time was 0845. The flight departed EWR at 1004 EST with 28 passengers and 3 crewmembers aboard. The FO was the pilot flying (PF) and the captain was the pilot monitoring (PM). The en-route portion of the flight was uneventful. At 1132 EST the crew received the most recent PQI weather report, which indicated winds were from 090 degrees at 5 knots, 1/2-mile visibility, and a broken ceiling at 1100 feet, with an overcast layer at 1800 feet. The flight was cleared for the ILS RWY 1 approach at PQI (see figure 1). When the flight was about four minutes from landing, they contacted airport maintenance³ and were told that the runway was clear of snow removal vehicles, and they were ok to land. At 1000 feet agl⁴, the captain stated that the approach was stable. The PF was using the autopilot, and no localizer or glideslope deviations were noted. The captain made the 500, 400, and 200-foot callouts. She stated she saw the lights, but also saw a tower that looked very close. The FO stated he saw a structure with an antenna and knew this was not right. The flight executed a go-around at about 100 feet agl. They received vectors from Boston Center and prepared to execute the ILS approach to runway 1, a second time. After an inquiry from the crew, airport maintenance confirmed that the runway lights were on “bright”. The second approach proceeded normally, with no problems capturing or maintaining the localizer and glideslope. The captain stated she saw the tower again on the second approach. The FO did not see the tower on the second approach because he was focusing inside the airplane on the localizer and glideslope indications. The PF used the autopilot down to about 100 feet above the decision altitude⁵. According to the cockpit voice recorder transcript, the captain called “runway in sight twelve o’clock, light are ah” less than two seconds after the

² Flight Operations Quality Assurance.

³ PQI was an uncontrolled field. There was a NOTAM (notice to airman) in effect that required all arrivals to contact the airport 10 minutes prior to arrival. This was to ensure that snow removal equipment was clear of the runway.

⁴ Above ground level

⁵ According to the FAA Instrument Procedures Handbook, the Decision Altitude (DA) is a specified altitude in the precision approach (in the case of this approach at PQI, 678 ft mean sea level, or 200 feet agl) at which a missed approach must be initiated if the required visual reference to continue the approach has not been established. See Federal Aviation Regulation (FAR) 91.175 for a list of list various visual references, including the approach light system, which would allow a flight to descend below DA.

EGPWS⁶ announced arrival at the decision altitude. The FO stated, “kay I’m staying on the flight director ‘cause I don’t see it yet”. In an interview, he stated he saw white on white, with blowing snow. He stated it was difficult to understand what he was seeing because everything was covered in snow. Before he could figure out what he was seeing, the airplane touched down on the snow-covered area between Runway 1 and a parallel taxiway located about 630 feet to the right of Runway 1 . He estimated that they were 100 to 150 feet to the right of the runway. The captain stated the localizer and glide slope were centered, and she had called runway in sight. As they were flaring, it was like they hit something. She remembered bouncing up and down a few times, then the airplane came to a stop.

⁶ Enhanced Ground Proximity Warning System is a safety system installed in the aircraft that, among other things, can provide selected altitude call-outs to a crew as they descend during an instrument approach.

LOC I-PQI 108.7	APP CRS 006°	Rwy ldg 7439
		TDZE 478
		Apt Elev 534

ILS or LOC RWY 1

NORTHERN MAINE RGNL ARPT AT PRESQUE ISLE (PQI)

When local altimeter setting not received, use Houlton Intl altimeter setting and increase all DA 89 feet and all MDA 100 feet, increase S-LOC 1 Cats. C and D and Circling Cat C visibility ¼ mile, increase Circling Cat D visibility ½ mile, increase HATEN Fix Minimums S-LOC 1 Cat C and Circling Cat C visibility ¼ mile, increase S-LOC 1 Cat D and Circling Cat D visibility ½ mile. For Inop MALSRL when using Houlton Intl altimeter setting, increase S-ILS-1 all Cats. visibility to 1 mile. **LOC only, 1140 when using Houlton Intl altimeter setting.



MISSED APPROACH:
Climb to 1100 then climbing left turn to 3000 direct PQI VOR/DME and hold, continue climb-in-hold to 3000.

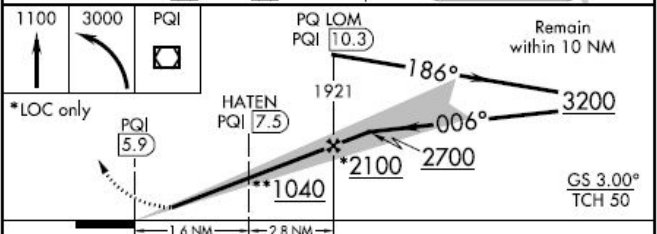
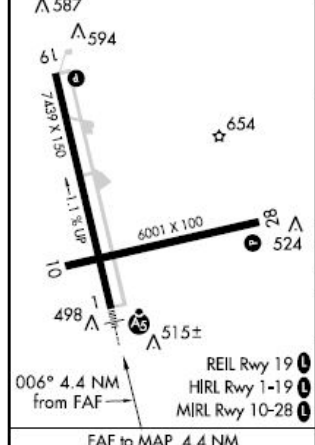
AWOS-3PT 118.025	BOSTON CENTER 124.75 239.05	CLNC DEL 121.6	UNICOM 122.8 (CTAF)	122.6
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NE-1, 28 FEB 2019 to 28 MAR 2019

NE-1, 28 FEB 2019 to 28 MAR 2019

ELEV 534	TDZE 478
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CATEGORY	A	B	C	D
S-ILS 1	678-½ 200 (200-½)			
S-LOC 1	1040-½	562 (600-½)	1040-1	1040-1¼
CIRCLING	1120-1	1160-1	1160-1¾	1200-2
HATEN FIX MINIMUMS				
S-LOC 1	900-½	422 (500-½)	900-¾	422 (500-¾)
CIRCLING	1120-1	1160-1	1160-1¾	1200-2

PRESQUE ISLE, MAINE
Amdt 6 02JUL09

NORTHERN MAINE RGNL ARPT AT PRESQUE ISLE (PQI)
46° 41'N - 68° 03'W

ILS or LOC RWY 1

Figure 1 PQI ILS 1 approach chart (Source: FAA)

2.0 Flight Deck Crew Information

The flight deck crew consisted of a captain and a first officer. The captain occupied the left seat and was the pilot-in-command for the flight; the FO occupied the right seat and was the pilot flying. There was no one on the flight deck jump seat.

2.1 The captain

According to interviews and records provided by CommutAir, the captain had joined Republic Airlines in October of 2012. She left the airline in January of 2013 following the failure to achieve an ATP certificate with a DHC-8 type rating. In March of 2013, she joined CommutAir as an SIC in the DHC-8 aircraft. She left the company in November of 2015 and joined Virgin America, where she completed a A-320 type rating in January of 2016. Shortly after that, she left Virgin America and returned to CommutAir in May of 2016 as an SIC on the DHC-8 aircraft. In October of 2017, she obtained an EMB-145 type rating and began serving as PIC on the aircraft.

A request to the FAA returned no records of previous accidents or incidents for the captain.

Additional information about the captain, including her pre-accident activities, is contained in the Human Performance Factual Report for this accident.

The captain last flew to PQI on February 28, 2019.

2.1.1 The Captain's Pilot Certification Record

FAA records for the captain indicated the following:

Private Pilot – Airplane Single Engine Land certificate issued July 12, 2008.

Private Pilot – Airplane Single Engine Land; Instrument Airplane certificate issued December 20, 2008

Commercial Pilot – Airplane Multiengine Land; Instrument Airplane; Private Pilot privileges Airplane Single Engine Land certificate issued March 25, 2009.

Commercial Pilot – Airplane Single and Multiengine Land; Instrument Airplane certificate issued March 29, 2009

Notice of Disapproval – Airline Transport Pilot Airplane Multiengine Land, DHC-8 Type Rating issued December 9, 2012. Areas for reexamination: approaches to stall and stall recovery (First Attempt.)

Notice of Disapproval – Airline Transport Pilot Airplane Multiengine Land, DHC-8 Type Rating issued December 17, 2012. Areas for reexamination: non-precision approaches (Second Attempt.)

Commercial Pilot – Airplane Single and Multiengine Land; Instrument Airplane; DHC-8; English Proficient; DHC-8 SIC Privileges Only; DHC-8 Circ. Apch.-VMC Only certificate issued January 7, 2013

Airline Transport Pilot – Airplane Multiengine Land; DHC-8; Commercial Pilot Privileges Airplane Single Engine Land; English Proficient; This certificate is subject to pilot-in-command limitation for DHC-8; ATP Circ. Apch.-VMC Only; DHC-8 Circ. Apch.-VMC Only certificate issued April 20, 2013

Airline Transport Pilot – Airplane Multiengine Land; A-320 DHC-8; Commercial Pilot Privileges Airplane Single Engine Land; English Proficient; This certificate is subject to pilot-in-command limitation for DHC-8; ATP Circ. Apch.-VMC Only; DHC-8 A-320 Circ. Apch.-VMC Only certificate issued January 12, 2016

Notice of Disapproval – Airline Transport Pilot Airplane Multiengine Land, EMB-145 Type Rating issued September 26, 2017. Areas for reexamination: steep turns, takeoff with engine failure. Applicant elected to forgo remaining elements. Re-examination to include takeoff with engine failure; V1 cut; RNAV approach, single-engine missed approach, one engine inoperative ILS manually flown; 10 knot tailwind landing; landing in sequence from and ILS; one engine inoperative landing. (First Attempt.)

Airline Transport Pilot – Airplane Multiengine Land; A-320 DHC-8 EMB-145; Commercial Pilot Privileges Airplane Single Engine Land; English Proficient; The DHC-8 is subject to pilot-in-command limitation(s); ATP Circ. Apch.-VMC Only; A-320 DHC-8 EMB-145 Circ. Apch.-VMC Only certificate issued October 4, 2017

2.1.2 The Captain’s Certificates and Ratings Held at Time of the Accident

FAA records for the captain indicated the following:

AIRLINE TRANSPORT PILOT (issued October 4, 2017)

Airplane Multiengine Land

A-320 DHC-8 EMB-145

Commercial Pilot Privileges Airplane Single Engine Land

English Proficient. ATP Circ. Apch.-VMC Only. A-320 DHC-8 EMB-145 Circ. Apch.-VMC Only

The DHC-8 is subject to pilot-in-command limitation(s).

MEDICAL CERTIFICATE FIRST CLASS (issued May 10, 2018)

Limitation(s): none

2.1.3 The Captain’s Training and Proficiency Checks Completed

The captain’s recent training history based on CommutAir records:

Date of Hire (CommutAir)	May 25, 2016
Date Upgraded to Captain on EMB-145	October 27, 2017
Date of Initial Type Rating on EMB-145	October 4, 2017
Date of Most Recent Proficiency Check	August 11, 2018
Date of Most Recent LOFT	February 11, 2019
Date of Most Recent Recurrent Ground Training	August 10, 2018
Date of Most Recent PIC Line Check	September 12, 2018

2.1.4 The Captain’s Flight Times

The captain’s flight times, based on CommutAir records, are shown below.

Times do not include the accident flight. Times are shown in hours. Other than total flying time, these times do not include any flying done outside of CommutAir.

Total pilot flying time	5655
Total EMB-145 flying time	1044
Total EMB-145 PIC time	1044
Total flying time last 24 hours	0
Total flying time last 7 days	21
Total flying time last 30 days	75
Total flying time last 90 days	225
Total flying time last 12 months	774

2.2 The First Officer

According to interviews and records provided by CommutAir, the first officer had joined Republic Airlines in May of 2018, and completed his training, to include a type rating on the EMB-145 in July of 2018. Prior to joining CommutAir, he had mostly piston aircraft experience in part 91 operation, including some flight instruction. He retired from the Army in 2011 as a lieutenant colonel. He did not fly in the Army.

A request to the FAA returned no records of previous accidents or incidents for the FO.

Additional information about the first officer including his pre-accident activities, is contained in the Human Performance Factual Report for this accident.

He last flew to PQI on February 27, 2019.

2.2.1 The First Officer’s Pilot Certification Record

FAA records for the First Officer indicated the following:

Notice of Disapproval – Private Pilot Airplane Single Engine Land issued December 14, 1996.
Areas for reexamination: Traffic Patterns, Ground Reference Maneuvers (First Failure.)

Private Pilot – Airplane Single Engine Land certificate issued December 18, 1996.

Private Pilot – Airplane Single Engine Land; Instrument Airplane certificate issued October 23, 1997.

Notice of Disapproval – Commercial Pilot Airplane Single Engine Land issued October 3, 1998.
Areas for reexamination: Lazy Eights (First Failure.)

Commercial Pilot – Airplane Single Engine Land; Instrument Airplane certificate issued October 18, 1998.

Commercial Pilot – Airplane Single and Multiengine Land; Instrument Airplane certificate issued October 18, 1998.

Ground Instructor-Advanced certificate issued February 8, 2001.

Flight Instructor – Airplane Single Engine certificate issued July 4, 2001. Renewed July 24, 2003, July 15, 2005, June 1, 2007.

Flight Instructor – Airplane Single and Multiengine Airplane certificate issued April 23, 2008. Renewed April 13, 2010, April 13, 2012, April 8, 2014, March 20, 2016, March 14, 2018.

Airline Transport Pilot – Airplane Multiengine Land; EMB-145; Commercial Pilot Privileges Airplane Single Engine Land; English Proficient; This certificate is subject to pilot-in-command limitation for EMB-145; ATP circ. apch.-VMC only; EMB-14 circ. apch.-VMC only certificate issued July 25, 2018.

2.2.2 The First Officer’s Certificates and Ratings Held at Time of the Accident

AIRLINE TRANSPORT PILOT (issued July 25, 2018)

Airplane Multiengine Land

EMB-145

Commercial Privileges Airplane Single Engine Land

English Proficient. ATP Circ. Apch.-VMC Only. EMB-145 Circ. Apch.-VMC Only

The EMB-145 is subject to pilot-in-command limitation(s).

MEDICAL CERTIFICATE FIRST CLASS (issued October 9, 2018)

Limitation(s): Holder shall possess glasses for near/intermediate vision.⁷

2.2.3 The First Officer’s Training and Proficiency Checks Completed

The FO’s recent training history based on CommutAir records:

⁷ The first officer reported in a post-accident interview that he was wearing sunglasses with bifocals at the time of the accident.

Date of Hire (CommutAir)	May 17, 2018
Date of Initial Type Rating on EMB-145	July 25, 2018
Date of Most Recent Proficiency Check	July 25, 2018
Date of Most Recent LOFT	January 6, 2019
Date of Most Recent Ground Training (Initial)	June 22, 2018

2.2.4 The First Officer’s Flight Times

The first officer’s flight times, based on CommutAir records, are shown below. Times do not include the accident flight. Times are shown in hours. Other than total flying time, these times do not include any flying done outside of CommutAir.

Total pilot flying time	4909
Total EMB-145 flying time	470
Total EMB-145 PIC time	0
Total flying time last 24 hours	0
Total flying time last 7 days	12
Total flying time last 30 days	64
Total flying time last 90 days	201
Total flying time last 12 months	470

3.0 Medical and Pathological Information

A rapid urine drug screen was performed on samples provided by the accident flight crew after the accident. The results for common drugs of abuse and alcohol for each crewmember was reported as “none detected”.

4.0 Aircraft Information

The airplane was an Embraer EMB-145XR, registration N14171, and serial number 14500859. It was manufactured in 2004. It had a Transport Category Airworthiness Certificate issued October 22, 2004. The airplane had 50 passenger seats and one crewmember seat in the cabin. There were 3 flight crew seats on the flight deck, including the observer’s seat (jumpseat.) The airplane had two Rolls Royce AE 3007A1E turbofan engines. It is shown in figure 2, below.

The airplane was owned by Wells Fargo Bank/United Airlines in Salt Lake City, Utah. It was operated by Champlain Enterprises, LLC, doing business as CommutAir. CommutAir operated 32 EMB145XRs at the time of the accident.

There were no deferred maintenance items (MELs) for the accident flight. No deficiencies of the airplane were noted by the crew during the accident flight.



Figure 2 The accident airplane (source: aeroside.com)

4.1 Weight and Balance

WEIGHT & BALANCE / PERFORMANCE (maximum weights in bold)	
Basic Operating Weight	29,263 lbs.
Cargo / baggage / passengers	6222 lbs.
Zero Fuel Weight (ZFW)	35,485 lbs.
Fuel	11,000 lbs.
Taxi fuel burned	300 lbs.
Takeoff Weight	46,185 lbs.
Maximum Takeoff Weight	53,131 lbs.
Planned landing weight	42,471 lbs.
Maximum Landing Weight	44,092 lbs.
Takeoff Center of Gravity (CG) (operating index)	-18.0
Takeoff CG limits (operating index)	-26.8 – -8.8

5.0 Meteorological Information

The following weather information for the KPQI airport is taken from the Meteorology Factual Report for the accident.

METAR KPQI 041556Z AUTO 08006KT 1/2SM SN FZFG OVC013 M02/M04 A2970

(KPQI weather observation at 1056 EST, automated, wind from 080° at 6 knots, visibility 1/2 mile in moderate snow and freezing fog, ceiling overcast at 1,300 ft agl, temperature -2° C, dew point temperature -4° C, altimeter 29.70 inches of mercury (Hg).)

SPECI KPQI 041618Z AUTO 06004KT 1/2SM SN FZFG M03/M04 A2968

(KPQI special weather observation at 1118 EST, automated, wind from 060° at 4 knots, visibility 1/2 mile in moderate snow and freezing fog, sky condition missing, temperature -3° C, dew point -4° C, altimeter 29.68 inches of Hg.)

Accident 1629Z (1129 EST)

SPECI KPQI 041643Z AUTO 07005KT 3/4SM -SN SCT008 OVC013 M01/M04 A2967

(KPQI special weather observation at 1143 EST, automated, wind from 070° at 5 knots, visibility 3/4 mile in light snow, scattered clouds at 800 ft agl, ceiling overcast at 1,300 ft, temperature -1° C, dew point -4° C, altimeter 29.67 inches of Hg.)

For more information on the weather, see the Meteorology Factual Report for this accident.

6.0 Aids to Navigation

Runway 1 at the KPQI airport was served by a Category 1 Instrument Landing System (ILS)⁸. The system was in normal service at the time of the accident, and no anomalies had been reported to airport operations concerning the system. According to the flight release paperwork for the flight, there were no NOTAMS in effect for any components of the ILS RWY 1 approach at the airport.

In the evening of 2 March, two days prior to the accident, another crew from a CommutAir flight operated into PQI had reported an offset discrepancy for the localizer signal. The report was made to the Boston Air Route Traffic Control Center after their landing at PQI. For additional information on this report, see the Air Traffic Control Factual Report for this accident.

Localizer signal problems had also been reported in previous years. See the Airport Specialist Factual for more information about previous ILS issues and post-accident ILS flight-testing by the FAA.

7.0 Communications

There were no known communication difficulties.

8.0 Airport Information

The accident occurred at PQI, the primary airport serving Presque Isle, Maine. The airport does not have a control tower. Airport elevation was 534 ft. MSL⁹. It had two runways, designated 1/19 and 10/28. The accident occurred when the aircraft impacted terrain between runway 1 and a taxiway to the right of the runway.

⁸ According to the Aeronautical Information Manual, a Category 1 ILS provides for approach to a height above touchdown of not less than 200 feet and with runway visual range of not less than 1,800 feet.

⁹ Mean sea level.

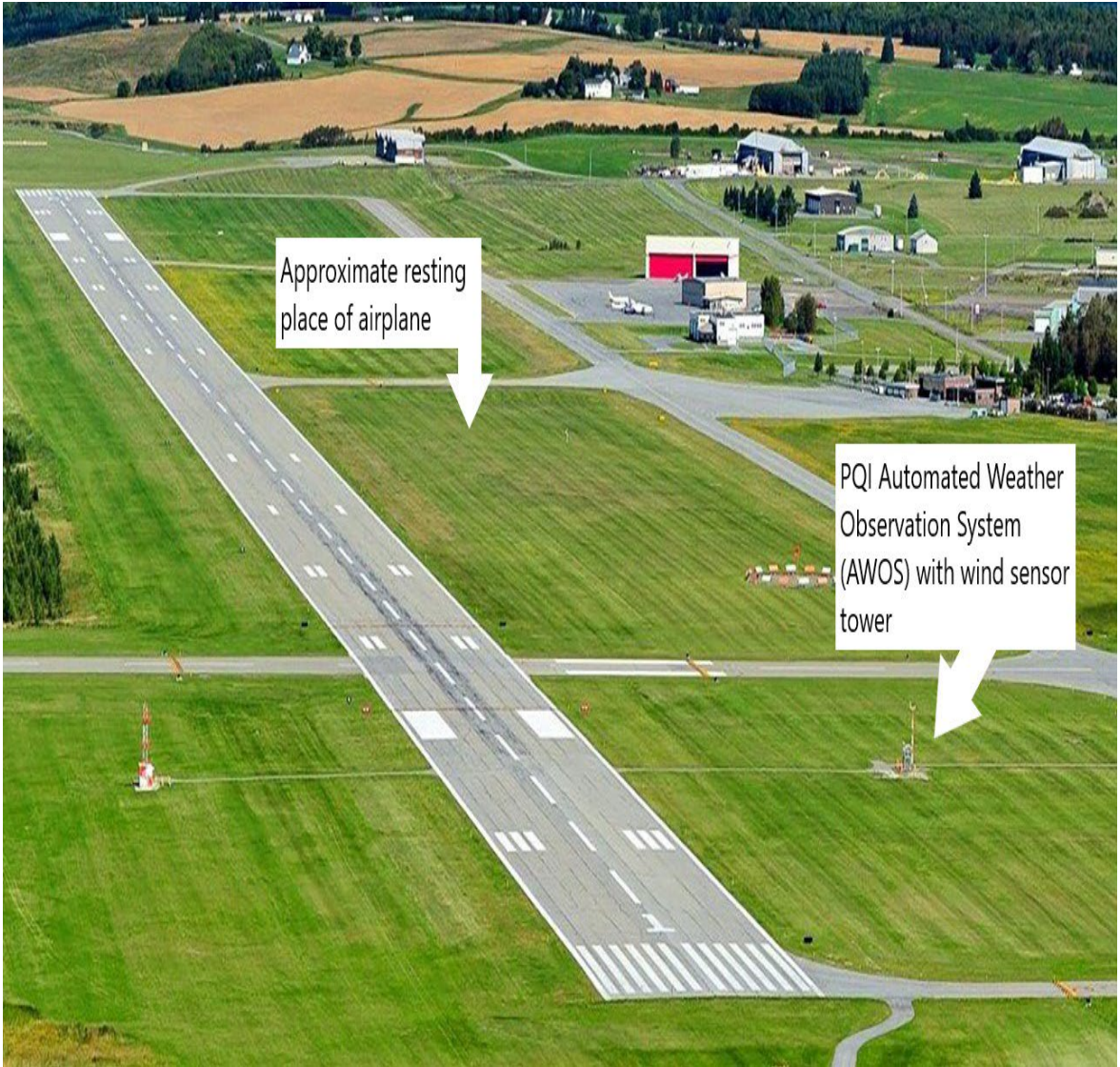


Figure 3-Runway 1 at PQI (source: Paul Cyr)

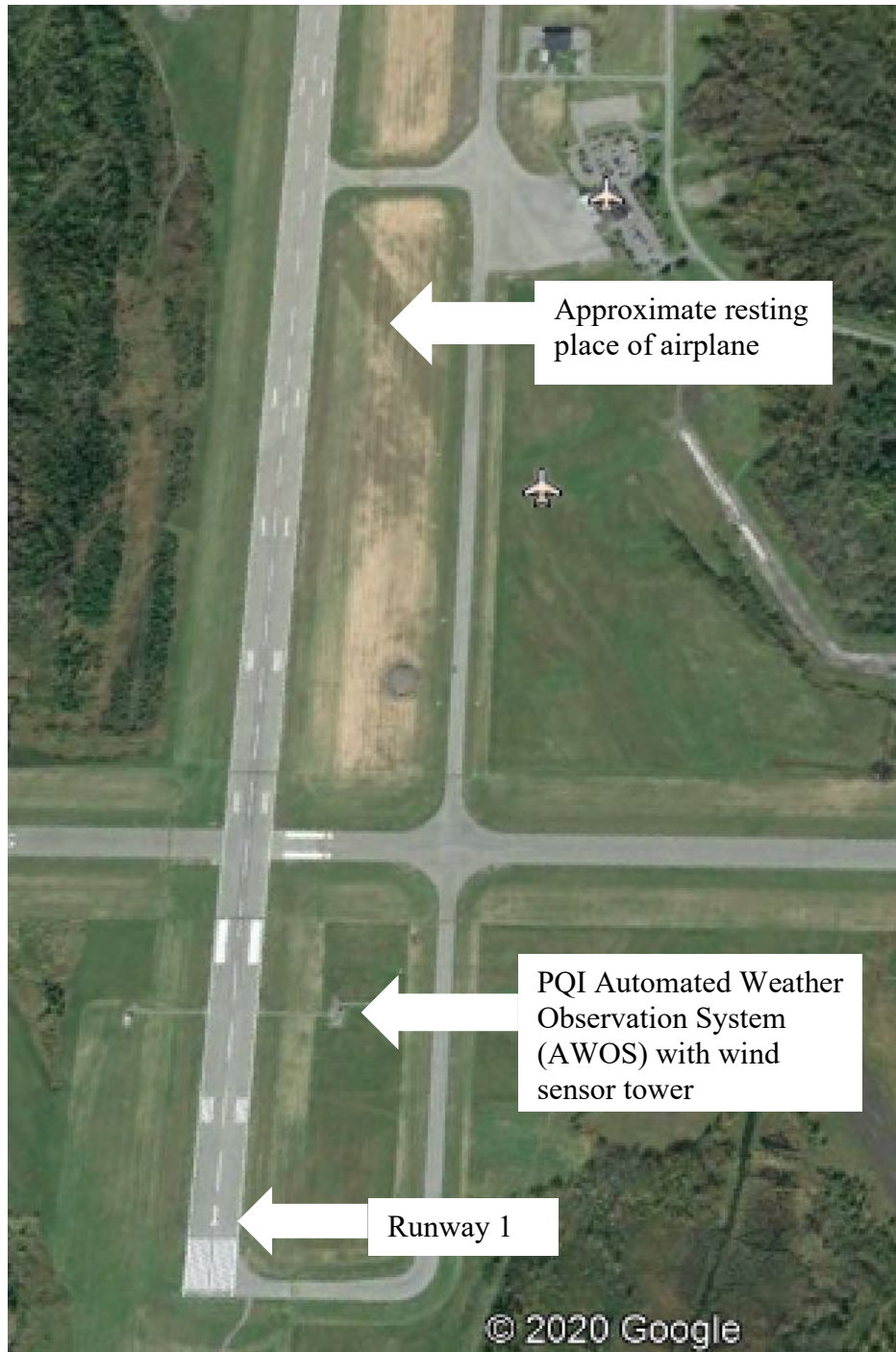


Figure 4 PQI runway 1 segment (source: Google Earth)

Runway 1 was 7439 ft. in length, and 150 ft. wide. The airplane came to rest about 3600 ft. from the runway threshold, in the grassy area between the runway and the taxiway, about 305 ft. right of the runway centerline, and 230 feet from the right edge of runway.



Figure 5 AWOS wind sensor tower (source: NTSB)

About 870 feet from the threshold of runway 1 and offset to the right of the runway centerline by about 325 feet was the airport's Automated Weather Observation System, which included a wind sensor tower with a lightning arrester mounted on the top. The location of the system is shown in figures 3 and 4, and the tower in figure 5. According to FAA Advisory Circular Advisory Circular No. 150/5220-16, the nominal height of an AWOS tower is 30 to 33 feet.

9.0 Relevant Policies and Procedures

9.1 Company Instrument Approach Procedures

Section 4.15.1 of the CommutAir EMB 145 Aircraft Operations Manual (AOM) provided the following guidance on the conduct of ILS Category 1 approaches and missed approaches.

For a normal instrument approach, regarding the duties of the pilot flying (PF) and the Pilot monitoring (PM), the manual states:

1. Responsibility of the PF/PM
 - a. The PF will monitor the instruments until the callout “Runway in sight”, then transition to outside references no later than 100 feet above the touchdown zone (TDZ) elevation.
 - b. The PM's responsibility is to monitor the approach, deliver the proper callouts and visually acquire the runway.

The tables below are taken from section 4.15.11 of the AOM, and show the actions and callouts for a precision approach flaps 45 ILS Category I.

Event	PF	PM
Before Initial Approach Fix	<ul style="list-style-type: none"> • APPROACH CHECK complete. • NAV Radios set. 	<ul style="list-style-type: none"> • NAV Radios identified.
IAF Outbound/ Downwind	<ul style="list-style-type: none"> • Slow to 180 KIAS. • N1 60% to 65%. <p>“FLAPS 9.”</p>	<ul style="list-style-type: none"> • Check airspeed indicator for correct V_{FE9}. • Select Flaps - 9°.
Localizer Inbound/ Base Leg	<ul style="list-style-type: none"> • Speed 180 KIAS. • N1 60% to 65%. • • Intercept and track localizer. 	<p>* <i>Localizer needle begins to move.</i></p> <p>“LOCALIZER ALIVE.”</p> <p>“LOCALIZER CAPTURED.”</p>
Glide Slope Alive (no later than 2 NM from FAF)	<p>“GEAR DOWN, FLAPS 22.”</p>	<p>* <i>Glideslope needle begins to move.</i></p> <p>“GLIDESLOPE ALIVE.”</p> <ul style="list-style-type: none"> • Select GEAR - DOWN. • Check airspeed indicator for correct V_{FE22}. • Select Flap - 22°.
At ½ Dot below Glideslope	<p>“FLAPS 45, LANDING CHECK.”</p>	<p>“½ DOT.”</p> <ul style="list-style-type: none"> • Check airspeed indicator for correct V_{FE45}. • Select Flap - 45°. • Accomplish LANDING CHECK.

Event	PF	PM
Glideslope Captured	Speed V_{AP} . N1 65%.	<ul style="list-style-type: none"> Ensure proper glideslope capture. “GLIDESLOPE CAPTURED.” <ul style="list-style-type: none"> Set Missed Approach Altitude in the Altitude Pre-select.
At Final Approach Fix (FAF)/Outer Marker	<ul style="list-style-type: none"> Identify FAF. Speed V_{AP}. Verify FAF crossing altitude. 	<ul style="list-style-type: none"> Identify FAF. “FINAL APPROACH FIX INBOUND.” <ul style="list-style-type: none"> Verify FAF crossing altitude.
1000 Feet above DA	<ul style="list-style-type: none"> Landing Clearance received? 	“1000 FEET.” <ul style="list-style-type: none"> Landing Clearance received?
500 Feet above DA	“CLEARED TO LAND.”	“500 FEET, CLEARED TO LAND.”
At Selected Altitudes		“400, 300, 200, 100”
Arrival at DA, Runway Environment in sight	<ul style="list-style-type: none"> Auto Flight Crewmember - Off (No later than 200 feet AGL). “CONTINUING.” <ul style="list-style-type: none"> Continue instrument scan. Continue approach to 100 feet above TDZE. 	“MINIMUMS, ___ IN SIGHT, CONTINUE.”

Event	PF	PM
Runway in sight	<p>“LANDING YAW DAMPER AUTOPILOT OFF.”</p> <ul style="list-style-type: none"> • Yaw Damper - Off (No later than 50 feet AGL). • Transition from Instrument to Visual scan. • Slow to V_{REF}. 	<p>“RUNWAY IN SIGHT _____ O’CLOCK.”</p> <ul style="list-style-type: none"> • Monitor approach. • Call: <ol style="list-style-type: none"> 1. Sinkrates in excess of 1000 ft/min. 2. Any significant deviation from a glide slope and/or localizer. 3. Any significant deviation from a normal landing attitude. • Inform PF of airspeed at regular intervals (+10/-0 KIAS).

Event	PF	PM
Arrival at DA, Runway environment NOT in sight	<p data-bbox="544 373 922 409">“MISSED APPROACH.”</p> <ul data-bbox="544 436 889 688" style="list-style-type: none"> <li data-bbox="544 436 889 548">• Advance Thrust Levers to Thrust Set. <li data-bbox="544 575 889 688">• Simultaneously press Go-around button. <p data-bbox="544 703 841 781">“CHECK THRUST, FLAPS 9.”</p> <ul data-bbox="544 808 928 919" style="list-style-type: none"> <li data-bbox="544 808 928 919">• Rotate to FD command bars (10° without FD). 	<p data-bbox="971 275 1349 352">“MINIMUMS - RUNWAY NOT IN SIGHT.”</p> <ul data-bbox="971 682 1377 907" style="list-style-type: none"> <li data-bbox="971 682 1263 718">• Check thrust. <li data-bbox="971 737 1344 772">• Select FLAPS - 9°. <li data-bbox="971 791 1377 907">• Check EICAS for thrust set and flaps 9° indication. <p data-bbox="971 926 1230 961">“THRUST SET.”</p>

i. Continue with Action & Callouts for Missed Approach - OR -

Event	PF	PM
100 Feet above TDZE, Runway NOT in sight	<p data-bbox="544 1283 922 1318">“MISSED APPROACH.”</p> <ul data-bbox="544 1346 889 1598" style="list-style-type: none"> <li data-bbox="544 1346 889 1457">• Advance Thrust Levers to Thrust Set. <li data-bbox="544 1484 889 1598">• Simultaneously press Go-around button. <p data-bbox="544 1612 841 1690">“CHECK THRUST, FLAPS 9.”</p> <ul data-bbox="544 1717 928 1829" style="list-style-type: none"> <li data-bbox="544 1717 928 1829">• Rotate to FD command bars (10° without FD). 	<p data-bbox="971 1184 1268 1262">“RUNWAY NOT IN SIGHT.”</p> <ul data-bbox="971 1591 1377 1816" style="list-style-type: none"> <li data-bbox="971 1591 1263 1627">• Check thrust. <li data-bbox="971 1646 1344 1682">• Select FLAPS - 9°. <li data-bbox="971 1701 1377 1816">• Check EICAS for thrust set and flaps 9° indication. <p data-bbox="971 1835 1230 1871">“THRUST SET.”</p>

Section 4.16 of the AOM provides the following guidance for conducting a missed approach.

04.16.1 WHEN TO CALL MISSED APPROACH / GO-AROUND

- At the Missed Approach Point or Decision Altitude with runway environment not in sight.
- At full deflection of Localizer and/or Glideslope.
- After the loss of a required navigation facility, indication, or instrument.
- If the successful completion of the approach is ever in doubt.
- When the Stabilized Approach Criteria cannot be met at 1000 feet above TDZE on instrument approaches and visual approaches.

NOTE:

Either Flight Crewmember (Flight Crewmember Flying or Flight Crewmember Monitoring) can call for a missed approach/go-around at any time during the approach and transition to landing. If either Flight Crewmember calls for a missed approach/go-around, the PF must execute the maneuver without hesitation.

04.16.2 IDENTIFYING THE MISSED APPROACH POINT

1. Precision Approach
 - a. The Missed Approach Point during a precision approach is at the DA(H).
2. Non-Precision Approach
 - a. The Missed Approach Point during a non-precision approach is at a published point identified by a fix defined by a Nav aid, DME and/or timing.

The CommutAir General Operations Manual (GOM), in section 3.47, states the following about landing from a straight-in instrument approach:

1-03.47 LANDING FROM A STRAIGHT IN INSTRUMENT APPROACH

14 CFR: 91.175 121.651

1. Upon reaching DH or the MDA, the pilot:
 - a. May continue the approach below DH or MDA to touchdown if:
 - (1) The aircraft, using normal maneuvers and normal descent rate, can land within the Touchdown Zone.
 - (2) The flight visibility is not less than the visibility prescribed in the approach procedure being used.
 - (3) Except for a CAT II or CAT III approach where any necessary visual reference requirements are specified by the Administrator, at least one of the following visual references for the intended runway is distinctly visible and identifiable: (hereafter referred to in this section as "visual reference to the runway").
 - b. The Approach Light System, except that the pilot may not descend below 100 feet above the Touchdown Zone elevation using the approach lights as a reference unless the red Terminating Bars or the red Side Row Bars are also distinctly visible and identifiable.
 - c. Threshold, Threshold markings or Threshold lights.
 - d. REILS or VASI
 - e. Touchdown Zone or Touchdown Zone Markings.
 - f. Touchdown Zone lights.
 - g. The runway or runway markings.
 - h. The runway lights.
 - (1) In the case of a straight-in, Non-Precision Approach, descent to landing should not begin until reaching the Visual Descent Point (VDP) if its location will permit the use of normal rates of descent and operating procedures.
 - i. Must execute a Missed Approach if upon reaching the DH or Missed Approach Point (MAP) or any time thereafter if any of the conditions required for a straight-in or circling approach are not met.

9.2 Company Actions Following the Accident

Following the accident, CommutAir took several steps to increase safety in the airline's operations. Those steps were outlined in several Crew Memos.¹⁰ Crew Memo 19-04, dated March 13, 2019, listed the following safety enhancements for operations at PQI:

- 1) All arrivals will be planned with a destination alternate, and all departures will be planned with a takeoff alternate. The takeoff alternate requirement will be temporary until additional manual updates are completed and distributed.
- 2) Both Thrust Reversers must be operative for all takeoffs and landings at PQI (not new, just a restatement of an existing control).
- 3) In addition to the normal approach briefing, the Missed Approach Actions and Callouts (AOM Section 4, 04.16.4) must be reviewed prior to each approach.
- 4) All approaches will require runway lighting to be activated. As a reminder, pilot-controlled lighting at PQI operates on frequency 122.6, not the airport CTAF.
- 5) Runway markings must be visible and clearly identified by both pilots to descend below MDA and land.
- 6) Runway centerline markings must be clearly identifiable for all departures.

In addition, in February of 2020, the airline provided the NTSB with a document listing other actions it had taken to improve safety:

- Incorporate lessons learned from this accident into flight operations and our current FAA approved training program – CAP developed and implemented by Flight Training.
- All approach callouts have been reviewed, improved where necessary, and added to the Aircraft Operations Manual (AOM) in a tabular format for ease of use and reference.
- In addition to the normal approach briefing, a complete review of the actions and callouts of a missed approach/go around are mandatory for every approach. Go-arounds are rarely performed and reviewing the procedure not only reduces the possibility of error during execution but prepares and empowers the flight crew to make a timely decision to execute a go-around (Missed Approach Actions and Callouts; AOM Section 4, 04.23.4).

¹⁰ According to the CommutAir's General Operations Manual, Crew Memos cover issues of an administrative nature; they are required to be reviewed by each pilot. Guidance contained in crew memos is mandatory, to the extent that it modifies existing practices as outlined in the GOM or AOM.

- Training has been enhanced to emphasize the importance of displaying, on the FMS for both pilots, an extended RNAV centerline for all approaches, enhancing situational awareness by adding a means of verifying aircraft position relative to the extended centerline of the runway that is independent from ground-based nav aids.
- Training has been enhanced to emphasize the requirement for both pilots to visually acquire the approach lights on an instrument approach before descending below MDA/DH and for both pilots to visually acquire the runway environment before continuing a descent with the intention to land. An additional callout has been added for the PF to state “Verified” as each of these items is visually acquired.

Incorporate current generation thinking and discoveries in Crew Resource Management (CRM) and Threat and Error Management (TEM) to enhance the safety of flight operations – CAP developed and implemented by Flight Operations and Safety.

- Collaborate with recognized industry experts in human factors to understand current generation thinking and discoveries in this field.
- Coordinate with our partner, United Airlines, to review their CRM/TEM training program and manual and to begin development of enhancements to our training in these areas.
- Incorporate “top of climb” and “post flight” CRM/TEM debriefings between the PIC and SIC to cover what was done right, what could have been done better, and what will be done going forward to ensure a safe and successful outcome.
- Include CRM objectives into training events and daily line flights. Incorporate Captain-led briefings and debriefings into each Line Oriented Flight Training (LOFT) event and incorporate the same briefings and debriefings into each line flight. The briefings and debriefings are conducted using the standardized format provided to all flight crew members on hang tags carried on their lanyards. Regular briefings and debriefings between both pilots and between the pilots and the flight attendants are included on the hang tags. All checking events, including check rides and line checks, include line items to ensure that all crewmembers are complying with this procedure.

Improve training on recognizing and immediately reporting flight safety hazards – CAP developed and implemented by Flight Operations and Safety.

- Add a question to the “top of climb” and “post flight” CRM/TEM debriefings between the PIC and SIC asking if anything occurred during the flight that should be reported to the Company.
- Promote and encourage immediate flight crew reporting through the on-call Flight Managers and the SOC Duty Managers.
- Continue monthly safety promotion tours to maintenance bases and flight crew bases, emphasizing the importance of reporting, promoting timely and complete reporting, and emphasizing and promoting the “If you SEE something, SAY something!” campaign.

The document also listed actions that the airline intended to accomplish:

The following training enhancements are planned for continuous improvement of the training program – CAP for additional improvements developed by Flight Training.

- Incorporate the scenario of an erroneous localizer signal into simulator training as a required item.
- Incorporate scenarios that highlight the critical importance of SOP compliance.
- Incorporate a Case Study of this accident into initial and recurrent ground training.
- Enhance the Captain upgrade curriculum by adding additional Command leadership refresher training sessions after six months on the line.

NOTE: The above items will require an expansion of the training footprint.

- The following enhancements in CRM/TEM are planned for continuous improvement of flight safety – CAP for additional improvements developed by Flight Operations and Safety.
- Continue to meet with industry experts and academics to enhance and update CRM/TEM training modules using current generation thinking and discoveries regarding human factors and cognitive biases.

- Review, analyze, and adopt the current generation elements of the CRM/TEM training program of our partner, United Airlines, that are relevant to our operation.
- Update and enhance CRM training modules to make a positive impact on the PIC vs SIC dynamic and discuss different styles of professional interaction between crewmembers.
- Enhance the Captain upgrade curriculum by adding additional leadership training sessions after six months on the line to refresh the Captain on CRM/TEM training and skills.
- The following enhancements to training on recognition and reporting of hazards to flight safety are planned for continued improvement of flight safety – CAP for additional improvements developed by Flight Operations and Safety.
- Re-sequence Initial New Hire non-flight training topics such as hazard recognition and safety reporting to post simulator training, allowing for better retention of knowledge in those areas.
- Incorporate safety issue reporting tasks into Initial and Recurrent LOFT scenarios.
- Enhance the Captain upgrade curriculum by adding additional leadership training sessions after six months on the line to refresh the Captain on Hazard identification and reporting.

An update received from the company in April of 2021 indicated that several items from this list of items that the company intended to accomplish had been accomplished, and others were still planned. The update also noted that “All pilots are now issued electronic flight bags (EFBs) with the Jeppesen FD PRO X application. Aircraft position is overlaid on electronic charts for all phases of flight. Pilots now have superior situational awareness”.

9.3 Crewmember Daily Read

The CommutAir GOM, section “08 Pilot General”, subsection “1-08.38.2 Crewmember Daily Read,” stated:

1. The Crewmember Daily Read is printed with the dispatch release message. It contains important information that may or may not be applicable to the General Operations

Manual. The PIC is to ensure that information contained in the Crewmember Daily Read is disseminated to the rest of the flight crew.

Note: If a paper copy of any Daily Read is not available, the PIC may call dispatch and receive a verbal briefing on the Daily Read items.

The Crewmember Daily Read in the dispatch release for the accident flight contained several items dealing with PQI, including the requirement for the crew to obtain an updated Runway Condition Code within one hour of landing, a reminder for crews to determine if the NOTAM was in effect which required a call to the airport 10-minutes prior to landing, and a reminder of the frequency to be used to activate the runway lights at the airport. There was no mention of any reported problems or concerns with the localizer signal for the runway one ILS approach.

10.0 ASAP/ASRS Reports

According to an interview with the CommutAir Safety Program Manager, several Aviation Safety Action Program (ASAP)¹¹ reports regarding the PQI ILS 1 localizer offset were submitted after the accident. The reports concerned flights during the period of 1-3 March 2019.

A CommutAir captain and FO each filed ASAP reports through WBAT indicating that on a 2 March 2019 flight, they had experienced an offset of the localizer course to the right of the runway. Both pilots stated they had contacted Boston Center after landing (about 2330 EST) and informed them of the offset. The Boston Center controller stated he would “look into it.”

Another crew filed reports indicating that on a 1 March flight, a similar offset was observed during a night arrival in VMC conditions. The captain stated it was his first time into the airport and attributed the apparent offset to lack of familiarity with the airport and the approach. Unlike the ASAP reports noted above, this report did not indicate that the crew notified ATC or the FAA about the offset.

Copies of the reports from the two flight crews are contained in attachment 2.

The Safety Program Manager indicated that no reports regarding PQI had been submitted prior to the accident.

A search of the Aviation Safety Reporting System (ASRS) operated by NASA did not show any ASRS reports concerning the PQI ILS 1 localizer during the period from January 2000 to the accident date. The search was for events at PQI that occurred during the initial approach, final approach, or landing phases of flight, or included ATC equipment /Nav facility as the primary problem.

¹¹ Information on CommutAir’s ASAP program and other company safety reporting policies is contained in the Human Performance Factual Report.

F. LIST OF ATTACHMENTS

Attachment 1: Interview Summaries

Attachment 2: CommutAir ASAP reports for PQI localizer

Submitted by:

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