Aviation Investigation Final Report

Location:	Anchorage, Alaska	**Incident Number:**	ANC12IA024
Date & Time:	March 5, 2012, 21:54 Local	**Registration:**	N544LM
Aircraft:	BOMBARDIER LEARJET CORP. 35A	**Aircraft Damage:**	Minor
Defining Event:	Loss of control on ground	**Injuries:**	6 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled - Air Medical (Medical emergency)		

Analysis

As the medical transport flight descended below the cloud cover during dark night, instrument meteorological conditions while on approach, the flight crew discovered that the first officer's windscreen was entirely covered with ice and that she would not be able to continue the approach. Although the captain's windscreen was partially covered with ice, he could still see the runway, so he took control of the airplane and continued the approach. The flight crew then confirmed that the windscreen heating and alcohol anti-ice systems were on. As the airplane passed over the runway threshold, the captain's windscreen abruptly iced over, and he had no forward visibility as the airplane's main landing gear wheels touched down. Unable to see the runway ahead and with limited visibility to each side, the flight crew attempted to activate the engine thrust reversers to slow the landing roll, but the airplane subsequently veered to the right of the runway centerline, and the right wing collided with a snow berm. The pilots reported no preincident mechanical malfunctions or failures that would have precluded normal operation.

About 15 minutes before the incident, the approach controller at an airport about 7 miles northeast of the incident airport advised the destination airport's north radar position controller that the pilot of another airplane had reported that he was "going around" due to severe icing on the airplane's canopy. No record was found indicating that this pilot report (PIREP) was relayed to the incident flight crew or other aircraft operating near the incident airport. Both airports are under the control of the same approach control facility. The meteorological conditions at the time of the accident were conducive to a very light freezing or frozen precipitation environment very close to or at the surface. Therefore, it is likely that the airplane encountered significant in-flight icing conditions during the approach and landing that exceeded the capabilities of the airplane's anti-ice systems. In addition, if the pilots had been made aware of the severe icing PIREP from the nearby airport, they likely would have had other options available for landing. The Federal Aviation Administration has indicated that it will form a PIREP working group to address issues associated with the dissemination of PIREPs.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be:

The flightcrew's loss of visual reference to the runway after encountering severe in-flight icing conditions, which resulted in a loss of control while landing and exceedence of the capabilities of the airplane's windscreen anti-ice systems. Contributing to this incident was the failure of the approach controller to relay a pilot report of severe icing conditions near the route of flight to the incident flight crew.

Findings

Aircraft	(general) - Attain/maintain not possible
Aircraft	Windows/windshields & doors - Capability exceeded
Environmental issues	Snow/ice - Ability to respond/compensate
Environmental issues	(general) - Availability of related info
Personnel issues	Lack of communication - ATC personnel

Factual Information

History of Flight

Approach	Structural icing
Landing-flare/touchdown	Loss of visual reference
Landing-flare/touchdown	Loss of control on ground (Defining event)
Landing-landing roll	Collision during takeoff/land
Landing-landing roll	Runway excursion

On March 5, 2012, about 2154 Alaska standard time, a Bombardier Learjet, model 35A airplane, N544LM, sustained minor damage while landing on runway 7R at the Ted Stevens Anchorage International Airport, Anchorage, Alaska. The airplane was operated by Aero Air LLC., Hillsboro, Oregon, under contract to LifeMed Alaska, Anchorage, Alaska, as an instrument flight rules (IFR) patient transport flight under 14 CFR Part 135. None of the six people aboard, the airline transport certificated captain, the commercial certificated first officer, two flight paramedics, a flight nurse, and the patient, reported any injuries. Dark night, visual meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan had been filed for the flight from Kenai, Alaska. The flight departed Kenai about 2130.

During an on-scene interview with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on March 5, the captain reported that the trip to Anchorage was to be flown by the first officer. He said that as the flight neared Anchorage, they were cleared for the RNAV GPS instrument approach to runway 7R. As the flight descended below the cloud cover, the pilots discovered that the first officer's windscreen was entirely covered with ice, and she would be unable to continue the approach.

The captain said that his windscreen was also partially covered with ice, but he could still see the runway environment ahead, so he took control of the airplane to continue the approach. After he confirmed that the windscreen anti-ice system was on, which provides bleed air heat to both windscreens, he also activated the alcohol anti-ice system, which works by pumping alcohol onto the captain's windscreen, as well as the nose radome. The captain said that as the airplane passed over the runway threshold, just before touchdown, his windscreen abruptly iced over, and he had no forward visibility as the airplane's main landing gear wheels touched down. Unable to see the runway ahead, and with limited visibility to each side, the crew attempted to activate the engine thrust-reversers to slow the landing roll, but the airplane subsequently veered to the right of runway centerline, and the right wing collided with a snow berm. The airplane pivoted to the right, continued off the runway, and came to rest embedded in a snow bank, on the right side of Runway 07R. Both pilots noted that there were no preaccident mechanical anomalies with the airplane.

The NTSB IIC removed the cockpit voice recorder (CVR), and sent it to the NTSB vehicle recorder laboratory in Washington, DC for review. After review of key events on the CVR, it was determined

that the audio did not offer any additional information that had not already been obtained from the flightcrew. No CVR listening group was convened, and no CVR transcript was created. A summary report of the CVR audio is included in the public docket for this accident.

METEOROLOGICAL INFORMATION

An NTSB senior meteorologist did a comprehensive study of the weather conditions around the Ted Stevens Anchorage International Airport at the time of the incident, which included a review of pilot reports of other aircraft operating nearby.

Ted Stevens Anchorage International Airport

The closest weather reporting facility was the Ted Stevens Anchorage International Airport. At 2153, about 1 minute before the incident, a routine weather observation was reporting, in part: Wind, 350 degrees (true) at 4 knots; visibility, 9 statute miles; clouds and sky condition, few at 1,300 feet, 2,000 feet scattered, 4,400 feet overcast; temperature, 14 degrees F; dew point, 10 degrees F; altimeter, 29.80 inches Hg. Remarks; Snow ended at 2149.

At 2241, about 47 minutes after the accident, a special weather observation was reporting, in part: Wind, 340 degrees (true) at 6 knots; visibility, 3 statute miles with light snow and mist; clouds and sky condition, few at 500 feet, 1,100 feet broken, 1,900 feet overcast; temperature, 14 degrees F; dew point, 10 degrees F; altimeter, 29.80 inches Hg. Remarks; station with a precipitation discriminator, snow began at 2203, trace hourly precipitation.

At 2253, about 59 minutes after the accident, a routine weather observation was reporting, in part: Wind, 010 degrees (true) at 3 knots; visibility, 2 statute miles with light freezing drizzle with mist; clouds and sky condition, few at 600 feet, 1,100 feet broken, 1,900 feet overcast; temperature, 16 degrees F; dew point, 12 degrees F; altimeter, 29.80 inches Hg. Remarks; station with a precipitation discriminator, freezing drizzle began at 2253 and snow began at 2203 and snow ended at 2253.

Elmendorf Air Force Base

Another official weather observation station was Elmendorf Air Force Base, about 7 miles northeast of the Ted Stevens Anchorage International Airport. At 2155, about 1 minute before the accident, a routine automated weather observation was reporting, in part: Wind, calm; visibility, 10 statute miles; clouds and sky condition, 700 feet broken, 3,800 feet overcast; temperature, 14 degrees F; dew point, 10 degrees F; altimeter, 29.80 inHg. Remarks: station with a precipitation discriminator, unknown precipitation began at 2122 and unknown precipitation ended at 2132 and snow ended at 2103.

Anchorage Area Pilot Reports

Federal Aviation Administration (FAA) quality control personnel at the Anchorage Air Traffic Control Tower (ATCT) provided the NTSB meteorologist with a recording of the Anchorage Approach North Radar air traffic control (ATC) position. The recording revealed communication between Elmendorf Air Force Base control tower (EDF) and the Anchorage Approach North Radar ATC position at 2139, about 15 minutes before the incident, with EDF advising the North Radar position of an F-16 airplane "going around" due to severe icing on his canopy. There was no record that this pilot report was relayed to the incident airplane, or another aircraft operating near the Ted Stevens Anchorage International Airport.

A complete copy of the NTSB's metrological study and attachments are included in the public docket of this incident.

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	52
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	September 11, 2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	December 9, 2011
Flight Time:	14000 hours (Total, all aircraft), 2700 hours (Total, this make and model), 13000 hours (Pilot In Command, all aircraft), 90 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	37
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	November 22, 2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 22, 2011
Flight Time:	2900 hours (Total, all aircraft), 120 hours (Total, this make and model), 600 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BOMBARDIER LEARJET CORP.	**Registration:**	N544LM
Model/Series:	35A	**Aircraft Category:**	Airplane
Year of Manufacture:	1982	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	500
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	February 24, 2012 AAIP	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	150 Hrs	**Engines:**	2 Turbo fan
Airframe Total Time:	12533 Hrs at time of accident	**Engine Manufacturer:**	GARRETT
ELT:	C126 installed, not activated	**Engine Model/Series:**	TFE 731 SER
Registered Owner:	AERO AIR LLC	**Rated Power:**	3500 Horsepower
Operator:	AERO AIR LLC	**Operating Certificate(s) Held:**	On-demand air taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	PANC,151 ft msl	**Distance from Accident Site:**	
Observation Time:	21:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Few / 1300 ft AGL	**Visibility**	9 miles
Lowest Ceiling:	Overcast / 4400 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/ Unknown
Wind Direction:	350°	**Turbulence Severity Forecast/Actual:**	/ Unknown
Altimeter Setting:	29.79 inches Hg	**Temperature/Dew Point:**	-10°C / -12°C
Precipitation and Obscuration:	In the vicinity - Freezing - Drizzle		
Departure Point:	Kenai, AK (PAEN)	**Type of Flight Plan Filed:**	IFR
Destination:	Anchorage, AK (PANC)	**Type of Clearance:**	IFR
Departure Time:	21:30 Local	**Type of Airspace:**	

Airport Information

Airport:	Ted Stevens Anchorage Int'l PANC	**Runway Surface Type:**	Asphalt
Airport Elevation:	151 ft msl	**Runway Surface Condition:**	Ice;Slush covered;Snow
Runway Used:	07R	**IFR Approach:**	Global positioning system
Runway Length/Width:	12400 ft / 200 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	Minor
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	6 None	**Latitude, Longitude:**	61.167778,-150.021118

Administrative Information

Investigator In Charge (IIC):	Johnson, Clinton
Additional Participating Persons:	Marcus Roulet; Federal Aviation Administration - Operations; Anchorage , AK Ricci Coon; Aero Air LLC; Anchorage , AK
Original Publish Date:	January 30, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=83048