



Aviation Investigation Final Report

Location:	Roswell, New Mexico	Accident Number:	CEN15LA091
Date & Time:	December 30, 2014, 08:25 Local	Registration:	N950FE
Aircraft:	Cessna 208B	Aircraft Damage:	Substantial
Defining Event:	Aerodynamic stall/spin	Injuries:	1 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

The airline transport pilot received a weather dispatch package for a planned cargo flight in a single-engine, turboprop-equipped airplane. The weather forecast called for instrument meteorological conditions (IMC) en route. The pilot reported that he encountered inflight icing and solid IMC for most of the flight and was unable to climb above 8,500 ft mean sea level due to icing on the airplane's wings. During the approach at his destination airport, he reported to the air traffic controller that he didn't have much elevator control and thought that his controls were "almost frozen."

The pilot was late in identifying the runway and elected to do a no-flap circling approach, staying below the clouds. During the maneuver, an intermittent stall warning horn was heard in the background of radio communications between the controller and the pilot, indicating that the airplane was below the manufacturer's recommended approach speed. The pilot stated that he "never went below 100 knots" during the approach; the manufacturer's minimum recommended no-flaps airspeed in icing conditions is 120 knots. Additionally, the manufacturer recommended using 10° of flap extension for landing when airframe ice was suspected.

Before crossing the runway threshold, the airplane experienced an uncommanded roll to the left, and the left wing and aileron impacted terrain. Examination of the airplane noted damage to the left wing, including the presence of frost and ice on the airplane.

It is likely that, during the approach for landing, the pilot did not compensate for the airframe icing by increasing the approach airspeed as recommended. The accident is consistent with the pilot not maintaining adequate airspeed during a circling approach to the runway, and the uncommanded roll is consistent with an aerodynamic stall. The situation was likely exacerbated by the presence of ice on the wings and control surfaces.

Probable Cause and Findings

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

The pilot's failure to maintain adequate airspeed to compensate for icing on the airplane's wings and control surfaces during a circling approach, which resulted in an aerodynamic stall and impact with terrain.

Findings

Personnel issues	Incorrect action selection - Pilot
Environmental issues	Conducive to structural icing - Contributed to outcome

Factual Information

History of Flight

Enroute	Other weather encounter
Enroute	Structural icing
Approach-circling (IFR)	Aerodynamic stall/spin (Defining event)
Landing-flare/touchdown	Dragged wing/rotor/float/other

On December 30, 2014, about 0825 mountain standard time, a Cessna 208B, N950FE, impacted terrain during landing at the Roswell International Air Center Airport (KROW), Roswell, New Mexico. The pilot was not injured, and the airplane received substantial damage. The airplane was registered to Federal Express Corporation, Memphis, Tennessee and operated by Baron Aviation Services, Inc., Vichy, Missouri, as flight [Show-Me] 8756. Day instrument meteorological conditions (IMC) prevailed at the time of the accident and an instrument flight rules (IFR) flight plan had been filed for the 14 *Code of Federal Regulations* Part 135 scheduled cargo flight. The airplane departed Lubbock Preston Smith International Airport (KLBB), Lubbock, Texas, about 0715 mountain standard time.

The pilot reported that he encountered inflight icing and solid IMC conditions for most of the flight and due to airplane performance was unable to climb above 8,500 feet mean sea level. In the post-accident interview, the pilot thought the altitude limitation was due to ice forming on the unprotected portions of the wings.

During the approach the pilot received vectors and altitude changes by the controller; the controller issued a clearance to 4,900 feet; the pilot acknowledged and stated that he didn't have much elevator control and thought that his controls were "almost frozen". In the post-accident interview the pilot added that he controlled his descent by adjusting power. He added that based on losing altitude, by using flaps during a climb, he elected not to use flaps on the approach; stating he never went below 100 knots on the approach.

About three miles from the runway the controller cleared the pilot down to 4,580 ft, and the pilot acknowledged the transmission. Two miles from the runway the controller reported he was "on course", and 4,280 ft was the recommended altitude.

The pilot was unable to identify the runway until too late for a normal descent to land. Rather than perform the missed approach procedures, he elected to turn left, for a circling approach to runway 35.

On the second landing attempt, before crossing the runway threshold, the airplane suddenly experienced an un-commanded roll to the left and the left wing and left aileron impacted terrain.

Pilot Information

Certificate:	Airline transport; Flight instructor	Age:	41
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	5-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	Toxicology Performed:	No
Medical Certification:	Class 1 With waivers/limitations	Last FAA Medical Exam:	September 15, 2014
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	November 10, 2014
Flight Time:	2798 hours (Total, all aircraft), 113 hours (Total, this make and model), 2730 hours (Pilot In Command, all aircraft), 113 hours (Last 90 days, all aircraft), 39 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

The pilot held an airline transport pilot certificate with rating for airplane single and multi-engine land, with instrument airplane. He also held a flight instructor certificate with ratings for single and multi-engine. He held a first-class medical certificate that was issued on September 15, 2016. On the NTSB 6120 form, the pilot reported 2,798 total flight hours with 113 hours in make and model.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N950FE
Model/Series:	208B	Aircraft Category:	Airplane
Year of Manufacture:	1987	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	208B0056
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	November 20, 2014 AAIP	Certified Max Gross Wt.:	7449 lbs
Time Since Last Inspection:		Engines:	1 Turbo prop
Airframe Total Time:	14945.4 Hrs at time of accident	Engine Manufacturer:	Pratt & Whitney
ELT:	C126 installed, not activated	Engine Model/Series:	PT6A-114
Registered Owner:	FEDERAL EXPRESS CORP	Rated Power:	675 Horsepower
Operator:	BARON AVIATION SERVICES INC	Operating Certificate(s) Held:	On-demand air taxi (135)
Operator Does Business As:	BARON AVIATION SERVICES INC	Operator Designator Code:	DEMA

The accident airplane was Cessna 208B, Caravan which is a high-wing, single-engine turbo-prop

airplane, with fixed-tricycle landing gear, and powered by a Pratt & Whitney PT6A engine. The airplane was on an approved aircraft inspection plan, with the last inspection on November 20, 2014. At the time of the accident the airplane had accumulated 14,945.4 hours

The Cessna 208B Pilot's Operating Handbook and FAA approved Airplane Flight Manual, Supplement S1, Known Icing Equipment states, in part:.

Environmental Conditions

Continued flight in icing conditions is prohibited after encountering one or more of the following:

1. Airspeed of 120 KIAS cannot be maintained in level flight.
2. Airspeed decrease of 10 KIAS that cannot be prevented by increase to maximum continuous power.
3. MEA or MOCA (if applicable) on current leg falls into Area "C" of Enroute Tool for Exiting Icing chart contained in the Performance Section of this supplement.

Minimum speed in icing conditions

Minimum airspeed in icing conditions, for all flight phases including approach, except takeoff and landing.

Flaps Up	120 KIAS
Flaps 10	105 KIAS
Flaps 20	95 KIAS

Required training

Specific training provided by Cessna Aircraft Company for flight into known or forecast icing conditions is required to be successfully completed by the pilot in command within the preceding 12 calendar months for any flight into known or forecast icing conditions.

The pilot reported that he took two on-line training courses, related to icing conditions.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	Condition of Light:	Day
Observation Facility, Elevation:	KROW,3669 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	07:51 Local	Direction from Accident Site:	59°
Lowest Cloud Condition:	500 ft AGL	Visibility	2 miles
Lowest Ceiling:	Broken / 500 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	15 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	40°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.4 inches Hg	Temperature/Dew Point:	-4°C / -6°C
Precipitation and Obscuration:	Light - None - Snow		
Departure Point:	LUBBOCK, TX (KLBB)	Type of Flight Plan Filed:	IFR
Destination:	Roswell, NM (KROW)	Type of Clearance:	IFR
Departure Time:	07:15 Local	Type of Airspace:	Air traffic control

At 0751 the automated weather observing system at KROW, reported wind from 020 degrees at 13 knots, visibility of 1 3/4 miles in light snow, broken clouds at 500 feet, temperature minus 4 degrees Celsius (C), dew point minus 6 degrees C, and an altimeter setting of 30.41 inches. Data from the United States Naval Observatory indicated that sunrise occurred at 0702.

According to the pilot, he received the weather package from the ramp agent at KLBB. He added, that pilots do not have access to the computers at KLBB. So, pilots would have to ask the ramp agent for any update.

The weather package the pilot received, was for IFR weather conditions en route. Several airports near or along the route noted snow, drizzle, or freezing rain.

Airport Information

Airport:	ROSWELL INTL AIR CENTER ROW	Runway Surface Type:	Asphalt
Airport Elevation:	3671 ft msl	Runway Surface Condition:	Snow
Runway Used:	35	IFR Approach:	ASR;Circling
Runway Length/Width:	9999 ft / 100 ft	VFR Approach/Landing:	None

The Roswell International Air Center Airport (KROW) is a publicly owned, open to the public, towered airport, located 3 miles south of Roswell, New Mexico. KROW has two runways: runway 3/21, concrete and is 13,001 ft by 150 feet, the second runway, 17/37, is asphalt, and is 9,999 ft by 100ft. The airport is at an elevation of 3,671 ft.

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	33.287223,-104.539169(est)

Communications

Excerpts from radio communications between air traffic controller and Show-Me 8756:

CONTROLLER: You're now 4 miles from the runway, slightly right of course, correcting. You can descend and maintain 4,000 -- or correction -- 4,900.

8756: 4,900. 8756. I don't have much elevator control. I think my controls are almost frozen.

CONTROLLER: Roger. No problems.

CONTROLLER: Two miles from the runway. You are on course, and you can begin your descent. 4,280 feet is the recommended altitude. Two miles from the runway, on course.

CONTROLLER: Show-Me 8756. In the event of a missed approach, fly the runway heading and climb to 6,000, and remain at this frequency.

8756: I'll try and see the runway as soon as I can. I want to get down. I really don't want to go around.

CONTROLLER: Okay. You're 1 mile from the runway. You're on course. The minimum descent altitude here is 4-0-6-0.

CONTROLLER: Thanks. About a half mile from the runway. You are on course.

CONTROLLER: Over the approach end of runway. You are on course. You've got about 10,000 feet to work with.

8756: What was my altitude, 4,600?

CONTROLLER: Four -- I'm reading you at 4-6. So you're about 1,000 feet above, 1,900 feet above.

8756: I got the -- I got the runway right below me right in sight. Not enough room. Can I circle around

from the --

CONTROLLER: Climb, and if you can keep it in sight and circle around to land. If not, climb -- try to get to 6,000, and let me know what you're going to do.

8756: Okay. I'm going to try and circle around and fix that. I have the runway now in sight. 8756.

CONTROLLER: Just verify you are able to keep the runway in sight?

8756: Yes. I have the tower in sight. I have the runway in sight. Do the best I can here. I'm going to feel like it's -- sorry about this.

CONTROLLER: No, no. This is no problem at all. We're glad you're -- got it in sight. If you'd like to, you can change over to the tower frequency, 118.5. It's up to you.

8756: I'll stay with you at the moment. I'm a little busy at the moment. 8756.

CONTROLLER: Roger. And Show-Me 8756, you are still cleared to land Runway 3-5.

CONTROLLER: I see that. Thanks.

The winds at the field are being reported at 0-3-0-1-2, gust 1-9.

8756: All right. Turning on final now. 8756.

8756: Declare an emergency. I have had a wing tip strike the ground, and it looks like I'm not -- I may -- I'm just going to shut it down here.

While on the circling approach to runway and during radio communications between the pilot and controller, an intermittent stall warning horn is heard in the transmission's background.

Additional Information

Examination of the airplane noted substantial damage to the wing, including the presence of frost and icing on the airplane.

Administrative Information

Investigator In Charge (IIC):	Latson, Thomas
Additional Participating Persons:	Dawna Gournic; FAA Lubbock FSDO; Lubbock, TX Andrew Hall; Textron Aviation; Wichita, KS Claude Beaudry; TSB Canada; Longueuil
Original Publish Date:	November 6, 2018
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=90551

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