National Transportation Safety Board
Aviation Accident Final Report

Location:	Barrow, AK	**Accident Number:**	ANC02FA020
Date & Time:	03/06/2002, 1203 AST	**Registration:**	N208TF
Aircraft:	Cessna 208B	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	5 None
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The air taxi pilot was flying four passengers and cargo to a remote camp and airstrip surrounded by principally flat, snow-covered tundra. He had difficulty locating the airstrip due to ice fog and reduced visibility, and initially flew over the top of the runway. A passenger saw the airstrip, and about the same time, the camp operator radioed the pilot that the airplane had just passed the camp. The pilot made a descent and an approach to the airstrip, but the airplane stalled and collided with terrain about 1/4 mile short of the runway. The camp operator noted that at the time of the accident there was ice fog in the area, and a portion of the runway was not visible due to the fog. He estimated the horizontal visibility to be about 3/4 of a mile. Postaccident inspection of the airplane disclosed approximately 1/2 inch of ice on the airplane's left lift strut and main landing gear leg. The pilot said after the accident that either a cabin door or cargo pod door may have opened during the approach. Postaccident inspection, and interviews with passengers, disclosed no evidence of an in-flight cargo or cabin door opening, and crush lines on the cargo pod door are consistent with the door being closed at impact.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's continued flight into adverse weather conditions, and an inadvertent stall. Factors associated with the accident are fog, obscuration, and icing conditions.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: APPROACH

Findings
1. (F) WEATHER CONDITION - FOG
2. (F) WEATHER CONDITION - OBSCURATION
3. (F) WEATHER CONDITION - ICING CONDITIONS
4. (C) FLIGHT INTO KNOWN ADVERSE WEATHER - CONTINUED - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH

Findings
5. (C) STALL/MUSH - INADVERTENT - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
6. TERRAIN CONDITION - SNOW COVERED

Factual Information

HISTORY OF FLIGHT

On March 6, 2002, about 1203 Alaska standard time, a wheel-equipped Cessna 208B airplane, N208TF, sustained substantial damage during approach to landing at a remote airstrip, known as Puviak, approximately 52 nautical miles southeast of Barrow, Alaska. The airplane was being operated as a visual flight rules (VFR) on demand charter flight under Title 14, CFR part 135, when the accident occurred. The airplane was operated by Tatonduk Flying Service of Fairbanks, Alaska. The airline transport pilot and the four passengers were not injured. The company's VFR flight following procedures were in effect. The flight originated at the Deadhorse Airport, Deadhorse, Alaska, about 1110, and was bound for Puviak.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on March 6, the company site manager at Puviak said he, and other personnel on the ground, saw and heard the airplane pass overhead, and radioed the airplane. He said the prepared runway was a compacted and marked snowfield, about 4,500 feet long. He said because of the fog, he could only see about three-quarters of the length of the runway. The airplane turned toward the runway, but crashed before reaching it.

During a telephone conversation with the IIC on March 9, the right front seat passenger said he was seated in the right front seat, and that he was wearing a headset. He said he was talking to the pilot on the intercom, and heard the radio call from the ground, advising them they had just passed over the airstrip. He said he never saw the airstrip, but the passenger seated behind the pilot did. He said during the flight from Deadhorse their cruising altitude was 8,000 feet, and the visibility was good, but as they approached the airstrip they "descended into the fog." He said from 500 feet they could see the ground. The passenger said once they started the left turn toward the airstrip the airplane started to shake, and porpoise. He said the pilot applied full power, and leveled the wings, but the airplane impacted the ground seconds later. He said once on the ground, outside the airplane, it was not raining or snowing, but it was foggy.

During a telephone conversation with the IIC on March 11, the pilot said that he passed over Puviak without seeing the airstrip. He said a passenger on the left side of the airplane spotted the airstrip, and then he received the radio call from the ground stating they just passed overhead. He said while he was making a standard rate left turn toward the airstrip, the airplane started to vibrate, shake, fishtail from side-to-side, and descend. He applied full power and leveled the wings. The airplane impacted on flat, snow-covered ground, about one-quarter mile from the airstrip. The pilot said he believed the number 4 cargo pod door came open in-flight. The number 4 cargo pod door is located farthest aft on the left side of the belly mounted cargo pod. The number 4 door cannot be seen from the pilot's position in-flight, and there is no warning indication if the door is open. He said he thought this happened because the number 4 door separated from the cargo pod at the point of impact. The pilot said that there were bands of fog in the area, but basic VFR conditions prevailed at the accident site. He further stated there were no signs of airframe icing on the airplane.

During a telephone conference call with the IIC on March 11, Federal Aviation Administration (FAA) airworthiness inspectors, who visited the accident site on March 9, stated that they saw evidence of in-flight icing on the airplane. They provided the IIC with photographs showing the buildup of ice on the leading edge of the left wing lift-strut. The ice builds from the leading

edge rearward on both top and bottom of the lift-strut.

PERSONAL INFORMATION

The pilot held a commercial and airline transport certificate with FAA ratings for single-engine land, single-engine sea, multi-engine land, and instrument airplane. The pilot was issued an FAA First Class Medical certificate on February 25, 2002. According to information received from the pilot, he has accumulated 22,000 total flying hours, 2,000 of which were in the make and model of the accident airplane, and he has accumulated 1,000 hours of instrument flying time.

AIRPLANE INFORMATION

The airplane was equipped with an icing equipment package certified for flight into known icing conditions. The package included pneumatic deicing boots on the wings, wing struts, horizontal stabilizer, and vertical stabilizer. The package also included electrically heated propeller blade anti-ice boots, a detachable electrical windshield anti-ice panel, electric pitot/static heat system, a standby electrical system, and inertia separator. The airplane was not equipped with any ice protection equipment on its landing gear struts or the cargo pod.

According to the load manifest provided by the operator, the airplane's takeoff weight was estimated to be 8658 pounds. According to the Cessna 208B INFORMATION MANUAL, the maximum allowable takeoff weight into known icing is 8550 pounds.

METEOROLOGICAL INFORMATION

The unofficial weather at the accident site, as reported by the site manager at the time of the accident, was sky partially to totally obscured by fog. The horizontal visibility at ground level was estimated to be 3/4 of a mile or less, and the temperature was 11 degrees F.

The closest official weather reporting stations to Puviak are Deadhorse and Barrow, Alaska. At 1153, Barrow, which is about 52 nautical miles northwest of the accident site, reported 2 1/2 miles visibility which decreased to 3/4 of a mile within the following 30 minutes. Barrow was also reporting a ceiling to of 100 feet variable to 500 feet. The temperature and dewpoint were both 12 degrees F. Deadhorse, which is about 130 nautical miles due east of the accident site, at 1153, reported 7 miles visibility with an overcast at 2,100 feet. Deadhorse's weather reported at 1053, was, 1 1/4 mile visibility in light snow with a ceiling at 600 to 800 feet. The temperature and dewpoint were 10 and 9 degrees F, respectively.

An AIRMET was issued for the northern half of the state of Alaska, and was valid through 1200. The AIRMET forecast severe icing above the freezing level, which was at the surface, low-level wind shear, and IFR conditions.

WRECKAGE INFORMATION

The airplane impacted on relatively flat, snow-covered ground, in a level, left wing low attitude. The cargo pod was crushed. All three landing gear were damaged, along with the propeller and engine mounts. There was structural damage to the landing gear attachments, firewall, and belly of the airplane.

The number 4 cargo pod door, when placed in the closed position, exhibited crush marks matching the marks on the door frame and cargo pod. See attached photographs.

No pieces or parts of the wreckage were taken or retained by the Safety Board.

ADDITIONAL INFORMATION

In a telephone conversation with the director of operations for the operator, which preceded the IIC's conversation with the pilot, the director of operations said the pilot had originally told him the upper half of the clamshell style cargo door came open in flight. This door is located on the aft left section of the fuselage passenger/cargo compartment. The door is equipped with an electrical switch which illuminates the red DOOR WARNING light on the pilot's annunciator panel when the door is not closed and latched properly. During interviews, and in written statements, none of the passengers in the passenger/cargo compartment said they saw the clamshell style cargo door open in-flight. The pilot said the red DOOR WARNING light did not illuminate during the flight. A subsequent inspection of the door, and the latching mechanism, showed that the mechanism was not damaged and was working properly. The pilot told the director of operations the airplane deice system was turned on at the time of the accident.

During a telephone conversation with the IIC, a Cessna representative said that Cessna has not received reports of the left aft clamshell style cargo door on the Cessna 208B inadvertently opening in-flight, when properly closed and latched. The Cessna 208B INFORMATION MANUAL reads in part, "if the upper cargo door is open, slow to 100 KIAS or less and lower the flaps to full down so that the wing downwash will move the door towards its normally closed position. If the door cannot be closed in-flight, a landing should be made as soon as practical... ."

The Cessna 208B INFORMATIONAL MANUAL reads, in part, "if any cargo pod door inadvertently opens in flight, the airplane should be slowed to 125 KIAS or less and landed as soon as practical."

The Cessna 208B INFORMATION MANUAL also says, in part, "...that many times the occurrence of an inadvertent door opening is not of great concern to the safety of the flight, but rather, the pilot's reaction... ."

Cessna EMERGENCY PROCEDURES state, in part, under "ICING";

"12. With an ice accumulation of 1/4 inch or more on the wing leading edges, be prepared for a significantly higher power requirement, approach speed, and stall speed, and longer landing roll."

"14. Use a minimum approach speed of 105 KIAS with the flaps retracted..."

The pilot reported the airplane speed at between 110 and 125 MPH, and that the airplane was configured for cruise flight with the flaps retracted. The pilot said the airplane was in a standard rate left turn when the airplane started the uncontrolled descent. The Cessna PILOT SAFETY AND WARNING SUPPLEMENT, says, in part,

"Airplane performance can be severely curtailed with ice accumulation. For instance, on some airplanes an accumulation of 1/2 inch of ice on the leading edges of the wings and empennage can cause a large (up to 500 FPM) loss in rate of climb, a cruise speed reduction of up to 30 KIAS, as well as a significant buffet and stall speed increase (up to 15 knots). Even if the airplane is certified for flight into known icing,... ."

In SECTION 5, PERFORMANCE it states,

"1. Altitude loss during a stall recovery may be as much as 300 feet from the wings-level stall,

and even greater from a turning stall."

The Cessna 208B INFORMATION MANUAL says that, in both the most forward, and most aft, center of gravity (CG) condition, the stall speed at 30 degrees bank angle is 84 knots calibrated airspeed (KCAS).

Pilot Information

Certificate:	Airline Transport; Commercial	**Age:**	50, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Balloon	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last Medical Exam:**	02/25/2002
Occupational Pilot:		**Last Flight Review or Equivalent:**	12/22/2001
Flight Time:	22000 hours (Total, all aircraft), 2000 hours (Total, this make and model), 165 hours (Last 90 days, all aircraft), 49 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Cessna	**Registration:**	N208TF
Model/Series:	208B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	208B0529
Landing Gear Type:	Tricycle	**Seats:**	10
Date/Type of Last Inspection:	02/12/2002, AAIP	**Certified Max Gross Wt.:**	9062 lbs
Time Since Last Inspection:	58.3 Hours	**Engines:**	1 Turbo Prop
Airframe Total Time:	4676 Hours	**Engine Manufacturer:**	P&W
ELT:	Installed, not activated	**Engine Model/Series:**	PT6A-114A
Registered Owner:	C&R Leasing, LLC	**Rated Power:**	675 hp
Operator:	TATONDUK OUTFITTERS LTD	**Air Carrier Operating Certificate:**	Commuter Air Carrier (135); On-demand Air Taxi (135)
Operator Does Business As:	Tatonduk Flying Service	**Operator Designator Code:**	FXGA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:		**Observation Time:**	
Distance from Accident Site:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Partial Obscuration	**Temperature/Dew Point:**	-12°C
Lowest Ceiling:	Unknown	**Visibility**	1.5 Miles
Wind Speed/Gusts, Direction:	Calm	**Visibility (RVR):**	
Altimeter Setting:		**Visibility (RVV):**	
Precipitation and Obscuration:			
Departure Point:	Deadhorse, AK (PASC)	**Type of Flight Plan Filed:**	Company VFR
Destination:	Barrow, AK	**Type of Clearance:**	VFR
Departure Time:	1109 AST	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	4 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	5 None	**Latitude, Longitude:**	70.616944, -155.001389

Administrative Information

Investigator In Charge (IIC):	Lawrence R Lewis	**Adopted Date:**	08/26/2002
Additional Participating Persons:	Thomas F Lane; Fairbanks FSDO-01; Fairbanks, AK		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		

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