



National Transportation Safety Board Aviation Accident Final Report

Location:	BETHEL, AK	Accident Number:	ANC00FA018
Date & Time:	12/07/1999, 1300 AST	Registration:	N1747U
Aircraft:	Cessna 207	Aircraft Damage:	Destroyed
Defining Event:		Injuries:	6 Fatal
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Scheduled		

Analysis

The airline transport pilot departed on a CFR Part 135 scheduled passenger flight to a remote coastal village. When the flight did not return, an aerial search was initiated. The wreckage was located the following day along the pilot's intended route, about 49 miles from the departure airport. The airplane had collided with flat, featureless, snow-covered, terrain. A pilot that departed about one minute after the accident airplane's departure, had a similar route of flight. He characterized the weather conditions along the accident airplane's route as overcast, with ceilings ranging between 2,500 and 4,500 feet. He said that as he approached the area of the accident, he encountered 'a wall of weather' starting from the ground, with tops at 1,500 feet. He added that visibility was low, with fog and varied layers of cloud cover. The pilot stated that he changed his route in order to avoid the worsening weather conditions. He added that with satisfactory weather conditions, and given the intended destination of the accident airplane, the standard route of flight would be directly over the location of the accident site. No preaccident anomalies were noted with the accident airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's continued VFR flight into instrument meteorological conditions. Factors associated with the accident were low ceilings, fog, and snow-covered terrain.

Findings

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

Findings

1. (F) WEATHER CONDITION - LOW CEILING
 2. (F) WEATHER CONDITION - FOG
 3. (C) VFR FLIGHT INTO IMC - CONTINUED - PILOT IN COMMAND
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Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: CRUISE

Findings

4. (F) TERRAIN CONDITION - SNOW COVERED

Factual Information

HISTORY OF THE FLIGHT

On December 7, 1999, about 1300 Alaska standard time, a wheel equipped Cessna 207 airplane, N1747U, was destroyed when the airplane collided with remote, snow-covered terrain, about 49 nautical miles west-southwest of Bethel, Alaska, at 60 degrees, 37 minutes north latitude, 163 degrees, 28 minutes west longitude. The airplane was operated by Grant Aviation, Inc., Anchorage, Alaska. The flight was being conducted under Title 14, CFR Part 135, as scheduled commuter Flight 261, when the accident occurred. The certificated airline transport pilot, and the five passengers aboard, all received fatal injuries. Company flight following procedures were in effect. The flight originated at the Bethel Airport, Bethel, at 1236, and was en route to Nightmute, Toksook, and Tununak, Alaska.

The flight failed to return to Bethel by 1530, and company dispatch personnel initiated a phone search. They discovered that the flight had never reached Nightmute, the first scheduled destination. A company aerial search was initiated about 1600. The flight was officially reported overdue to the Federal Aviation Administration (FAA) at 1713. Personnel from the Alaska State Troopers, Civil Air Patrol, and Alaska Air National Guard, were dispatched to search the route of flight, but were unable to locate the missing airplane. The wreckage was located on December 8, about 1330, along the anticipated route of flight to Nightmute. There was no emergency locator transmitter (ELT) signal from the airplane.

CREW INFORMATION

The pilot held an airline transport pilot certificate with airplane single-engine land, and multiengine land ratings. He also held a flight instructor certificate with airplane single-engine, and multiengine land, airplane ratings. His most recent first-class medical certificate was issued on July 20, 1999, and contained no limitations.

The pilot was hired by the company on July 12, 1999. On August 6, 1999, the pilot completed his initial Part 135 check ride in accordance with FAR 135.293 and 135.299.

According to the Pilot/Operator report (NTSB form 6120.1/2) submitted by the operator, the pilot's aeronautical experience consisted of 2,255 hours, of which 390 hours were accrued in the accident airplane make and model. In the preceding 90 and 30 days prior to the accident, the report listed a total of 301 and 66 hours, respectively.

According to the operator, on the day preceding the accident, the pilot accrued 3.0 hours of flight time.

AIRCRAFT INFORMATION

The airplane had accumulated a total time in service of 10,363.5 hours. An examination of the maintenance records revealed the most recent annual inspection of the engine and airframe was accomplished on April 28, 1999. The last recorded inspection of the engine and airframe was a 100-hour inspection, completed on November 13, 1999, 45.0 hours before the accident. The engine was overhauled on September 24, 1999, by Aero Recip Alaska, Inc., and had accrued 196.9 hours since overhaul.

METEOROLOGICAL INFORMATION

The closest weather observation station is Bethel, which is located about 49 nautical miles east-

northeast of the accident site. On December 7, at 1253, an Aviation Routine Weather Report (METAR) was reporting in part: Sky conditions and ceiling, 2,000 overcast; visibility, 10 statute miles; wind, calm; temperature, 0 degrees F; dew point, minus 7 degrees F; altimeter, 29.89.

Hooper Bay, Alaska, is located about 95 nautical miles northwest of the accident site. At 1255, an unaugmented AWOS was reporting, in part: Wind, 100 degrees (true) at 12 knots; visibility, missing; clouds, 7,500 feet broken; temperature, minus 4 degrees F; dew point, minus 11 degrees F; altimeter, 29.87 inHg.

Mekoryuk, Alaska, is located about 84 nautical miles south-southwest of the accident site. At 1255, an unaugmented AWOS was reporting, in part: Wind, 170 degrees (true) at 13 knots; visibility, 10 statute miles; clouds, 1,800 feet scattered, 2,500 feet overcast, 4,600 feet overcast; temperature, 12 degrees F; dew point, 9 degrees F; altimeter, 29.83 inHg.

An NTSB meteorologist reviewed the weather conditions around the accident location. The weather study revealed a trough of low pressure located along 150 degrees west longitude with two low pressure centers over the northern Gulf of Alaska. In addition, the study indicated a weak ridge of high pressure extending from the Bethel area westward to the Bering Sea. A complete copy of his report is appended.

An area forecast for the Yukon-Kuskokwim Delta, issued on December 7, 1999, at 1145, and valid until 0000, was forecasting, in part: Clouds and weather, 1,500 feet scattered, 9,000 feet broken, tops at 11,000 feet, with occasional 1,500 feet broken.

An AIRMET valid until 1800, was forecasting mountain obscuration in clouds and precipitation along the pilot's planned route of flight.

An amended terminal forecast for Bethel, valid from 1041 on December 7, was forecasting, in part: Wind, 190 degrees at 6 knots: Visibility greater than 6 statute miles; clouds and sky condition, 1,500 feet scattered, 2,500 feet overcast. Temporary changes expected between the valid forecast times, Visibility, 3 statute miles, light snow showers; clouds and sky condition, 4000 feet broken.

A pilot that departed from Bethel about one minute after the accident airplane's departure, had a similar route of flight. He characterized the weather conditions between Bethel and the accident site as overcast with ceilings ranging between 2,500 and 4,500 feet. He said that as he approached the accident site, he encountered "a wall of weather" starting from the ground, with the tops at 1,500 feet. He added that visibility was low with fog and varied layers of cloud cover. The pilot stated that he changed his route in order to avoid worsening weather conditions. He added that with satisfactory weather conditions, and given the intended destination of the accident airplane, the standard route of flight would be directly over the location of the accident site.

WRECKAGE AND IMPACT INFORMATION

The National Transportation Safety Board investigator-in-charge examined the wreckage at the accident site on December 9, 1999. The airplane was located in an area of flat, featureless, and snow-covered terrain. High winds, snow, fog, and sub-zero temperatures limited the available time at the scene. The investigator-in-charge returned to the accident site on May 22, 2000, and completed the on scene examination of the wreckage.

The main wreckage debris path was oriented on a 245 degree heading, and was about 195 feet

long. (All headings/bearings noted in this report are magnetic).

The first piece of airplane wreckage discovered along the debris path was a broken red navigation lens, and the left wingtip.

About 24 feet from the left wingtip debris was a crater, measuring about 5 feet in diameter, and 3 feet deep. The engine, engine firewall, lower cockpit floor, and propeller assembly, were within the crater.

The engine sustained extensive impact and fire damage to the underside, and front portion of the engine. The exhaust tubes were extensively crushed, bent, and folded, producing sharp creases that were not cracked or broken along the creases.

The propeller assembly separated from the engine crankshaft. The propeller blades and propeller hub were located within the 3 foot deep crater. Removal of the propeller assembly from the crater revealed the spinner was crushed aft, and folded and formed around the shape of the propeller hub assembly. The first propeller blade was observed underneath the engine, and bent aft. The two remaining propeller blades had minor leading edge gouging, and extensive "S" bending.

Extensive fuselage fragmentation was evident along the debris path between the crater and the main wreckage. A postcrash fire incinerated the airplane's fuselage.

All of the airplane's major components were located at the main wreckage site. Flight control system continuity was established aft of station 170. Further control continuity could not be confirmed due to extensive fire and impact related damage.

Both wings separated from the main fuselage. The inboard 1/3 portion of both wings had been consumed by fire. The unburned portions of both wing tips measured about 60 inches inboard. The left wing leading edge was compressed aft about 20 inches. The right wing leading edge was crushed aft about 8 inches.

The trailing edge flap jackscrew was not extended.

The entire empennage was separated from the fuselage at the forward vertical stabilizer attach point. Both elevators remained attached to the horizontal stabilizer. The left horizontal stabilizer displayed extensive leading edge aft crushing, and upward buckling of the underside of the stabilizer. The right horizontal stabilizer displayed minor upward buckling.

No preaccident anomalies were noted with the airplane.

Examination of the emergency locator transmitter (ELT) revealed that during the impact sequence, the lower battery container separated from the upper transmitter housing. The transmitter housing remained attached to the coaxial antenna cable, and was discovered within the main fuselage. The battery container was located within the main wreckage debris path.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination of the pilot was conducted under the authority of the Alaska State Medical Examiner, 5700 E. Tudor Road, Anchorage, Alaska, on December 10, 1999.

Toxicological samples taken from the pilot were analyzed by the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma. According to the toxicology report (attached), all tests were negative.

SEARCH AND RESCUE

Search personnel using snow machines from Bethel, Nightmute, Toksook Bay, and Tununak, were requested by the Alaska State Troopers office in Bethel. The search was suspended about 2400 due to deteriorating weather conditions, and resumed the following day, about 0900. On December 8, about 1330, airborne search personnel located the wreckage. There was no emergency locator transmitter (ELT) signal from the airplane.

TESTS AND RESEARCH

On January 24, 2000, an engine examination was conducted at Alaskan Aircraft Engines Inc., Anchorage, Alaska. The examination revealed the following:

The oil sump cover was crushed upward against the case.

The exhaust tubes were crushed, folded, and distorted, producing sharp creases that were not cracked or broken along the crease.

All of the cylinder cooling fins exhibited impact damage. The number five, and six cylinder valve covers were broken away from each cylinder head.

The fuel manifold screen was free of contaminants. The diaphragm was intact. The fuel servo inlet screen was free of contaminants.

The engine driven fuel pump was removed, disassembled, and visually inspected.

Both magnetos sustained substantial impact and fire damage.

The engine cylinders and pistons did not exhibit any unusual appearance. The presence of lubricants was noted throughout the engine. The crankshaft was displaced aft in the engine case about 1 inch, and was bent toward the top of the case. The camshaft was also displaced aft in the case.

No preimpact mechanical anomalies were noted during the examination of the engine.

The Emergency Locator

WRECKAGE RELEASE

The Safety Board released the wreckage to the owner's representatives on January 24, 2000. No parts or components were retained by the Safety Board.

Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	33, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine	Toxicology Performed:	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	07/20/1999
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	2255 hours (Total, all aircraft), 390 hours (Total, this make and model), 2150 hours (Pilot In Command, all aircraft), 301 hours (Last 90 days, all aircraft), 66 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N1747U
Model/Series:	207 207	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	20700347
Landing Gear Type:	Tricycle	Seats:	6
Date/Type of Last Inspection:	11/13/1999, 100 Hour	Certified Max Gross Wt.:	3800 lbs
Time Since Last Inspection:	45 Hours	Engines:	1 Reciprocating
Airframe Total Time:	10363 Hours	Engine Manufacturer:	Continental
ELT:	Installed, not activated	Engine Model/Series:	IO-520F
Registered Owner:	BRUCE E. LARSON	Rated Power:	300 hp
Operator:	GRANT AVIATION, INC.	Operating Certificate(s) Held:	Commuter Air Carrier (135); On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	ENHA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Day
Observation Facility, Elevation:	BET, 123 ft msl	Distance from Accident Site:	49 Nautical Miles
Observation Time:	1153 AST	Direction from Accident Site:	60°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	Overcast / 2000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	-18°C / -18°C
Precipitation and Obscuration:			
Departure Point:	, AK (BET)	Type of Flight Plan Filed:	Company VFR
Destination:	NIGHTMUTE, AK (IGT)	Type of Clearance:	None
Departure Time:	1236 AST	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	5 Fatal	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	6 Fatal	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	CLINTON O JOHNSON	Report Date:	04/18/2001
Additional Participating Persons:	WILLIAM K BOHMAN (FAA); ANCHORAGE, AK JAMES H THOMAS, JR. (CESSNA); WHICHITA, KS MATTHEW L THOMAS (NTSB); ANCHORAGE, 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.nts.gov/pubdms/ .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).