National Transportation Safety Board
Aviation Accident Final Report

Location:	McGrath, Alaska	**Accident Number:**	ANC11FA077
Date & Time:	August 13, 2011, 19:40 Local	**Registration:**	N91099
Aircraft:	Cessna 207	**Aircraft Damage:**	Substantial
Defining Event:	VFR encounter with IMC	**Injuries:**	2 Fatal, 4 Serious
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

The commercial pilot departed with five passengers on an on-demand air taxi flight between two remote Alaskan villages separated by mountainous terrain. When the airplane did not reach its destination, the operator reported the airplane overdue. After an extensive search, the airplane's wreckage was discovered in an area of steep, tree-covered terrain, about 1,720 feet msl, along the pilot's anticipated flight path. The flight was conducted under visual flight rules, but weather conditions in the area were reported as low ceilings and reduced visibility due to rain, fog, and mist. There is no record that the pilot obtained a weather briefing before departing.

According to a passenger who was seated in the front, right seat, next to the pilot, about 20 minutes after departure, as the flight progressed into mountainous terrain, low clouds, rain and fog restricted the visibility. At one point, the pilot told the passenger, in part: "This is getting pretty bad." The pilot then descended and flew the airplane very close to the ground, then climbed the airplane, and then descended again. Moments later, the airplane entered "whiteout conditions," according to the passenger. The next thing the passenger recalled was looking out the front windscreen and, just before impact, seeing the mountainside suddenly appear out of the fog.

A postaccident examination did not reveal any evidence of a mechanical malfunction. A weather study identified instrument meteorological conditions in the area at the time of the accident.

Given the lack of mechanical deficiencies with the airplane and the passenger's account of the accident, it is likely that the pilot flew into instrument meteorological conditions while en route

to his destination, and subsequently collided with mountainous terrain.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to continue visual flight rules flight into instrument meteorological conditions, which resulted in an in-flight collision with mountainous terrain.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Low visibility - Effect on operation

Factual Information

HISTORY OF FLIGHT

On August 13, 2011, about 1940 Alaska daylight time (ADT), a Cessna 207 airplane, N91099, impacted mountainous, brush-covered terrain, about 37 miles west of McGrath, Alaska. Of the six people aboard, the pilot and one passenger died at the scene, and four passengers received serious injuries. The airplane sustained substantial damage. The flight was operated by Inland Aviation Services, Inc., Aniak, Alaska, as a 14 CFR Part 135 visual flight rules (VFR) on-demand charter flight when the accident occurred. Visual meteorological conditions prevailed at the airplane's point of departure, and instrument meteorological conditions were reported along the airplane's flight route. The flight originated at the McGrath Airport, about 1915, and was en route to the Anvik Airport, Anvik, Alaska, before continuing on to Aniak, the airplane's home base. VFR company flight following procedures were in effect, but there is no record that a weather briefing was obtained before departure.

During a hospital room interview with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on August 16, a passenger related that the purpose of the flight was to transport a group of school teachers to Anvik before the start of the school year. His wife and two children were also aboard the accident airplane.

The passenger stated that he was seated in the front, right seat, next to the pilot. He said that about 20 minutes after leaving McGrath, as the flight progressed into mountainous terrain, low clouds, rain and fog restricted visibility. At one point the pilot told the passenger, in part: "This is getting pretty bad." The passenger said that the pilot then descended and flew the airplane very close to the ground, then climbed the airplane, and then it descended again. Moments later the passenger said that the airplane entered "whiteout conditions." The next thing the passenger recalled was looking out the front windscreen, and just before impact, seeing the mountainside suddenly appear out of the fog. He said that all of the survivors lost consciousness during the impact, and he was the first to regain consciousness.

The passenger noted that while boarding the airplane in McGrath, he happened to notice a SPOT satellite personal tracker that was clipped to the pilot's sun visor. He said that after the accident, he was able to find the SPOT device in the wreckage, and began pushing the emergency SOS button.

According to the operator, the pilot routinely carried his own SPOT satellite personal tracker. About 2030, family members in Wasilla, Alaska, the pilot's hometown, received an emergency SOS message from the pilot's SPOT device. A family member then immediately called the operator in Aniak to alert them of the distress message.

When the airplane failed to arrive in Aniak by 2045, company personnel initiated a phone and radio search to see if the airplane had diverted to another village. Unable to locate the airplane, company personnel initiated an aerial search along the pilot's anticipated route, but poor weather and dark night conditions prohibited a search of the entire flight route.

The Federal Aviation Administration (FAA) issued an alert notice (ALNOT) at 2200 Alaska daylight time.

PERSONNEL INFORMATION

The pilot, age 66, held a commercial pilot certificate with airplane single-engine land, multiengine land, single-engine sea, and instrument airplane ratings. In addition, he held a commercial rotorcraft helicopter certificate. The most recent second-class medical certificate was issued to the pilot on December 23, 2009, which contained no limitations.

In the Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1) submitted by Inland Aviation, the pilot's total aeronautical experience was listed as 25,000 flight hours, with 10,000 flight hours in the accident airplane make and model. The report noted that in the preceding 90 and 30 days prior to the accident, the pilot accrued a total of 60 flight hours and 30 flight hours.

During an interview with the NTSB IIC on August 24, Inland Aviation Service's president said that the accident pilot was initially hired on August 10, 2009, and he continued to fly for the company on a seasonal and as needed basis. He added that the accident pilot had operated his own air taxi business, Grayling Air Service, from 1974 to 1978, operating in the same geographic areas as Inland Aviation.

A review of company training records revealed that the pilot completed his initial ground and flight training on August 9, 2009. Additionally, the pilot received ground training in the use and operation of the automatic dependent surveillance-broadcast (ADS-B) / Capstone equipment installed in the accident airplane.

The pilot's most recent FAA Part 135.293 and 135.299 check ride was on August 5, 2010. Inland Aviation's president/director of operations, the FAA approved company check airman, administered the check ride. In the remarks section of FAA form 8410-3 it states, in part: "Demonstrated Instrument Competency."

Once the pilot completed the company's training program and passed a check ride, he was officially hired, then assigned to fly Cessna 207 airplanes from the company base in Aniak.

The pilot's normally scheduled duty day was from 0800 to 2200. In the three days prior to the accident, the pilot was off duty on August 11. On August 12, his duty day started at 0800, and he flew only .3 hours. On the accident date of August 13, the company president estimated that the accident pilot flew about 2.2 hours.

AIRCRAFT INFORMATION

According to the Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1) submitted by the operator, the airplane had a total time in service of 31,617.7 flight hours. The last recorded inspection of the engine and airframe was a 100-hour inspection, on July 18, 2011, about 20 flight hours before the accident.

METEOROLOGICAL INFORMATION

The closest weather reporting facility was the Tatalina Airport, 28 miles east-southeast of the accident site. At 1955, a weather observation from the Tatalina Airport was reporting, in part: Wind, 280 degrees at 5 knots; visibility, 3 statute miles; clouds and sky condition, 1,600 broken, 2,400 broken, 3,100 feet overcast; temperature, 54 degrees F; dew point, 52 degrees F; altimeter, 29.89 inches Hg.

The next closest official weather observation station was the McGrath Airport, the accident airplane's departure point, 37 miles south-southeast of the accident site. At 1953, an Aviation Routine Weather Report (METAR) was reporting, in part: Wind, 310 degrees at 7 knots; visibility, 10 statute miles; clouds and sky condition, 2000 feet few, 3,600 feet overcast; temperature, 57 degrees F; dew point, 52 degrees F; altimeter, 29.88 inHg.

An NTSB meteorologist did a comprehensive study of the weather conditions around the accident site, revealing two strong low pressure systems stretching west-northwest from the central Yukon to northwest Alaska. The study disclosed that the forecast for the area included increasing instabilities over the region that were expected to produce rain showers, fog, and reduced visibility.

Additionally, the NTSB meteorologist reviewed archived satellite imagery, captured about the time of the accident, which revealed evidence of low clouds, light rain, drizzle, fog, and instrument meteorological conditions (IMC) in the area around the accident site.

A copy of the meteorologist's report is included in the public docket of this accident.

WRECKAGE AND IMPACT INFORMATION

On August 14, the NTSB IIC, along with two Alaska State Troopers, and a Federal Aviation Administration (FAA) aviation safety inspector from the Anchorage Flight Standards District Office (FSDO), Anchorage, examined the wreckage at the accident site, and no mechanical problems were found.

All of the airplane's major components were found at the main wreckage site. The accident site was in an area of steep, mountainous, tundra and rock-covered terrain, with sparsely populated areas of low trees/scrubs, at an elevation of about 1,720 feet msl.

The main debris path was on a 260 degree heading, and uphill (All headings/bearings noted in this report are magnetic). An area believed to be the initial impact point, about 50 feet below the main wreckage site, was marked by broken shrubs and disrupted tundra.

Scattered upslope, in a line between the initial impact point and the final resting point of the main wreckage, were portions of wreckage debris, landing gear components, broken Plexiglas, aircraft seats, and personal effects.

The airplane's wings remained attached to the fuselage attaching points, but both had

extensive spanwise leading edge aft crushing. The wing's flight control surfaces remained connected to their respective attach points.

The airplane's empennage was severed just forward of the stabilizer attach point, but all of the flight control surfaces and control cables remained connected to their respective attach points.

The fuselage and cabin area was crushed inward. The airplane's belly, interior floorboards, and seat track rails, between the two front seats, extending aft to the third row seats, was torn aft, which exposed the occupants to terrain and broken trees.

The engine remained attached to the fuselage, but it was displaced about 30 degrees to the right.

The propeller and hub remained attached to the engine crankshaft. All three propeller blades were loose in the propeller hub, but remained attached to the hub assembly. All three of the propeller blades had multiple leading edge gouges, substantial torsional "S" twisting, and chordwise scratching.

Due to impact damage, the flight controls could not be moved by their respective controls, but continuity of the flight control cables was established to the cockpit area.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination was conducted under the authority of the Alaska State Medical Examiner, Anchorage, on August 16, 2011. The cause of death for the pilot was attributed to blunt force, traumatic injuries.

The FAA's Civil Aeromedical Institute performed toxicological examinations for the pilot on November 28, 2011, which was negative for alcohol.

The NTSB's chief medical officer reviewed the pilot's autopsy and toxicological reports, and extracted, in part, the following information.

The toxicology examination revealed naproxen in the urine and both diltiazem and flecainide in blood and urine. Naproxen, marketed under the trade names Naprosyn and Alleve, is a non-steroidal anti-inflammatory analgesic available both as a prescription and over-the-counter medication. Diltiazem, marketed under the trade names Cardiazem and Tiazac, is a calcium channel blocker used to treat hypertension and to provide rate control in patients with atrial fibrillation. Flecainide, marketed under the trade name Tambocor, is a class IC antiarrhythmic drug, used to treat both atrial and ventricular arrhythmias.

A copy of the NTSB chief medical officer's factual report is included in the public docket for this accident.

A review of the pilot's most recent second-class medical certificate application dated December 23, 2009, revealed that the pilot indicated "No" in response to "Do You Currently Use Any Medications" and "No" to all items under "Medical History." The application also notes a "No"

to "Visits to Health Professional within Last 3 Years."

SEARCH AND RESCUE

After being notified of an overdue airplane, and after learning about reports of an emergency locator transmitter (ELT) signal along the accident pilot's anticipated flight route, search and rescue personnel from the Air National Guard's 210th Air Rescue Squadron, Anchorage, began a search for the missing airplane.

Rescue personnel aboard an Air National Guard C-130 airplane tracked an analog, 121 MHz ELT signal to an area of mountainous terrain, but poor weather prohibited searchers from reaching the site until the next morning. The four seriously injured passengers remained at the accident site overnight.

The following morning, an Air National Guard HH-60G helicopter evacuated all personnel from the accident site.

The airplane was not equipped with, nor required to be equipped with, a digital, 406 MHz ELT that instantly transmits a distress signal to search and rescue satellites, thereby alerting rescue personnel within minutes of the location of the crash. As of February 1, 2009, analog, 121.5 MHz ELT's stopped being monitored by search and rescue satellites, and the installation of the 406 MHz has been voluntary.

ADDITIONAL INFORMATION

ADS-B / Capstone Technology

The FAA implemented national automatic dependent surveillance-broadcast (ADS-B) technology in Alaska, and the accident airplane was equipped with an avionics package as part of that program. Formerly known as Capstone, the joint industry/FAA program (which includes ground-based stations, satellites, and aircraft avionics) currently provides pilots with enhanced situational awareness by displaying the airplane's position over terrain, while using GPS technology, coupled with an instrument panel mounted, moving map display. Additionally, the Capstone equipment installed in the accident airplane provided the pilot with color shading on the moving map, which depicts terrain elevation changes. Selection of the terrain mode for display, provides the pilot with color shading, depicting areas of terrain that are black (2,000 feet below the aircraft), green (between 2,000 and 700 feet below the aircraft), yellow (between 700 and 300 feet below the aircraft), and red (at or within 300 feet of the aircraft).

At the time of the accident, position and flight track information from the accident airplane was recorded and archived at the Anchorage Air Route Traffic Control Center (ARTCC), Anchorage. The archived data was subsequently forwarded to the NTSB vehicle recorder laboratory in Washington, DC.

An NTSB senior electronics engineer analyzed the archived data, which included, in part, the accident airplane's altitude ground speed, and flight track data, all of which confirmed the

passenger's account of the accident. Additionally, he provided a flight track map overlay, along with aircraft performance plots, which are included in the public docket for this accident.

History of Flight

Enroute-cruise	VFR encounter with IMC (Defining event)
Enroute-cruise	Loss of visual reference
Enroute-cruise	Controlled flight into terr/obj (CFIT)

Pilot Information

Certificate:	Commercial	**Age:**	66,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	July 29, 2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	August 5, 2010
Flight Time:	25000 hours (Total, all aircraft), 10000 hours (Total, this make and model), 25000 hours (Pilot In Command, all aircraft), 60 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N91099
Model/Series:	207	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	20700073
Landing Gear Type:	Tricycle; Float	**Seats:**	6
Date/Type of Last Inspection:	July 18, 2011 100 hour	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	20 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	31618 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	C91 installed, activated, aided in locating accident	**Engine Model/Series:**	IO 520 SERIES
Registered Owner:		**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	Commuter air carrier (135), On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	B7TA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PATL,964 ft msl	**Distance from Accident Site:**	28 Nautical Miles
Observation Time:	19:55 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:		**Visibility**	3 miles
Lowest Ceiling:	Broken / 1600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.88 inches Hg	**Temperature/Dew Point:**	12°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	McGrath, AK	**Type of Flight Plan Filed:**	Company VFR
Destination:	Anvik, AK (PANV)	**Type of Clearance:**	None
Departure Time:	19:15 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal, 4 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal, 4 Serious	**Latitude, Longitude:**	63.101943,-156.99028(est)

Administrative Information

Investigator In Charge (IIC):	Johnson, Clinton
Additional Participating Persons:	Corey W Howlett; Federal Aviation Administration - Operations; Anchorage, AK Don W Thorstensen; Federal Aviation Administration; Anchorage, AK
Original Publish Date:	August 29, 2013
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=81494