Aviation Investigation Final Report

Location:	TYONEK, Alaska	**Accident Number:**	ANC01FA102
Date & Time:	August 9, 2001, 16:15 Local	**Registration:**	N4849C
Aircraft:	Cessna 185	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot departed his residence at a private lake in a float-equipped airplane to transport passengers to another remote lake. Prior to his departure, the airplane was fueled by the pilot from a 1,000 gallon metal tank located on his lake property. During the fueling process, the metal tank's fuel supply was exhausted, but sufficient fuel was obtained to fill one fuel tank, and nearly fill the other. Before departing for the day, the pilot purchased 15 gallons of additional fuel at a nearby airport and placed 5 gallons of the additional fuel in the airplane fuel tanks. He then conducted two round-trip flights to the remote lake. After a day of fishing at the remote lake, the pilot flew to his residence, and added 10 gallons of additional fuel to the airplane. Two empty five gallon fuel cans were found at his dock. He then departed on the accident flight to pick up additional passengers from the remote lake, but he did not arrive at his destination. The airplane was located inverted in an area of tall trees. The airplane flaps were extended full down. The engine did not appear to be running at the time of the accident. The airplane's fuel totalizer indicated 29 gallons of fuel. A postaccident examination of the engine found no mechanical malfunctions. Minor wrinkles were found along the bottom of each of the airplane's fuel bladders. The gascolator contained about a teaspoon of water and particulate contamination. The header tank had about an ounce of fuel and water. The fuel pump contained no fuel. Evidence of tan-colored particulate contamination was found in a fluid sample obtained from the fuel filter housing, attached to the pilot's fuel tank hand pump on his fuel tank.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of engine power during cruise flight due to fuel system contamination with water, and the pilot's inadequate preflight procedures. A factor in the accident was unsuitable terrain for

a forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: CRUISE

Findings
1. (C) FUEL SYSTEM - CONTAMINATION,WATER
2. (C) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
3. FLUID,FUEL - CONTAMINATION,OTHER THAN WATER

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
4. (F) TERRAIN CONDITION - NONE SUITABLE

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: EMERGENCY DESCENT/LANDING

Findings
5. OBJECT - TREE(S)

Factual Information

HISTORY OF FLIGHT

On August 9, 2001, at an estimated time of 1615 Alaska daylight time, a float-equipped Cessna 185 airplane, N4849C, sustained substantial damage during a collision with trees, about 20 miles northwest of Tyonek, Alaska. The airplane was being operated as a visual flight rules (VFR) cross-country personal flight when the accident occurred. The airplane was operated by the pilot. The private certificated pilot, the sole occupant, received fatal injuries. Visual meteorological conditions prevailed.

The night before the accident flight, a family member reported that the airplane was fueled by the pilot from a metal tank located at his residence on Memory Lake, Wasilla, Alaska. During the fueling process, the metal tank's fuel supply was exhausted, but the family member said that one of the airplane's fuel tanks was completely full, and the other was nearly full. The pilot obtained 15 gallons of additional fuel from the Wasilla Airport which he placed in three, five-gallon plastic containers. One container of five gallons was added to the airplane fuel tanks. On the day of the accident, the pilot departed the Memory Lake property and flew to Lucile Lake, Wasilla.

The pilot boarded several passengers at Lucile Lake, and flew to Beluga Lake, Alaska, located about 22 miles northwest of Tyonek. The pilot returned to Lucile Lake, boarded additional passengers, and flew to Beluga Lake. He remained at Beluga Lake and fished until about 1430. The pilot then departed and flew to his residence at Memory Lake, arriving about 1515. The distance from Memory Lake to Lucile Lake is about 3 nautical miles. The distance from Lucile Lake to Beluga Lake is about 58 miles.

Prior to the accident flight, the family member reported that the pilot added ten gallons of additional fuel to the airplane from the previously filled containers. He then departed from his residence about 1545 to pick up the passengers he transported to Beluga Lake on the earlier flights. The airplane did not arrive at Beluga Lake, and the flight was reported overdue by the family member about 1735. An emergency locator transmitter (ELT) signal was received by search personnel in the area of Beluga Lake. The airplane was located by search aircraft at 2027, inverted, in an area of thick brush, surrounded by tall spruce trees.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with airplane single-engine land and single-engine sea ratings. The most recent third-class medical certificate was issued to the pilot on August 15, 2000, and contained no limitations.

According to the pilot's logbook, his total aeronautical experience consisted of about 981 hours, with about 393 hours in the accident airplane make and model. In the preceding 90 and 30 days prior to the accident, the logbook lists a total of 29 and 7 hours respectively.

AIRCRAFT INFORMATION

The airplane had accumulated a total time in service of 2,353.9 hours. Examination of the maintenance records revealed that the most recent annual inspection of the airframe and engine was accomplished on September 1, 2000, 32.1 hours before the accident.

The engine had accrued a total time of 2,200.4 hours. The maintenance records note that a major overhaul was accomplished on October 7, 1991, 565.4 hours before the accident.

METEOROLOGICAL INFORMATION

The closest official weather observation station is Anchorage, Alaska, which is located 42 nautical miles east of the accident site. At 1653, an Aviation Routine Weather Report (METAR) was reporting in part: Wind, 170 degrees (true) at 7 knots; visibility, 10 statute miles; clouds and sky condition, few at 3,000 feet, 5,500 feet broken, 25,000 feet broken; temperature, 66 degrees F; dew point, 49 degrees F; altimeter, 30.22 inHg.

COMMUNICATIONS

There were no reports of communications with the accident airplane.

WRECKAGE AND IMPACT INFORMATION

The National Transportation Safety Board (NTSB) investigator-in-charge (IIC), along with an FAA inspector, examined the airplane wreckage at the accident site on August 10, 2001. The airplane was lying inverted in a small depression in an area of thick underbrush, surrounded by about 50 feet tall spruce trees. All of the airplane's major components were found at the main wreckage area. The nose of the airplane was oriented on a 280 degree magnetic heading. Two large trees, about 50 feet from the tail of the airplane, had broken tops.

The forward nose compartment of each float assembly was broken from their respective float, and were found about 3 feet forward of the nose of the inverted airplane. Two disruptions of the ground were adjacent to each broken nose compartment segment.

The engine was displaced aft and slightly downward. The upper side of the propeller spinner, the engine cowling, the windshield center brace, and the "V" brace, were crushed and buckled downward along a diagonal line from the propeller to the top of the cockpit windshield.

The right wing had spanwise leading edge aft crushing and curling from the tip to about the wing lift strut attach point, and the wing segment was bent downward. The leading edge metal

was curled downward. The right aileron remained attached to the wing.

A portion of the left wing had a chordline separation, about mid-point between the wingtip and the lift strut attach point. The exposed end of the wing spar, at the point of separation, had aft bending and slight upward curling. At the point of separation, the leading edge wing material had semi-circular shaped aft crushing. The torn wing segment was pivoted inboard and forward, along the front side of the wing. The left aileron remained attached to the wing.

Both lift struts remained attached to their respective wing and lower attach points. The float assemblies remained attached to their respective fuselage attach points, and had no damage except the previously noted damage to the nose of each float assembly.

The vertical stabilizer and rudder were crushed downward and forward, and curled to the left side of the empennage. The horizontal stabilizers and elevator had minor damage. The fuselage, aft of the cabin area, had wrinkling of the underside of the tail. The aft fuselage was displaced slightly downward.

The manual flap handle appeared to be raised to a full flap position (40 degrees). The wing flaps appeared to be fully extended.

Following recovery of the airplane, an additional wreckage examination was conducted at the Big Lake Airport, Big Lake, Alaska, on August 24. The parties noted in this report participated in the examination. Recovery personnel reported that when they were rigging the inverted airplane for helicopter retrieval, they opened the right wing fuel cap to remove extra weight from the airplane. Recovery personnel said that the right wing tank contained fuel that took several minutes to drain.

The flight control surfaces remained connected to their respective attach points. The horizontal stabilizer trim actuator was found extended 8.3 inches. According to the airplane manufacturer, the extended stabilizer actuator corresponded to a 7 degree tab up (nose-down) setting. Flight control system cable continuity was established from each control surface to the cabin/cockpit area.

The propeller assembly remained connected to the engine crankshaft. The propeller blades each had minor aft bending. The two engine cowl-mounted landing lights were undamaged.

The engine sustained impact damage to the upper front portion of the engine. The crankshaft could be rotated by the propeller. Gear and valve train continuity was established, and thumb compression in each cylinder was noted when the crankshaft was rotated by hand.

The mechanical fuel pump's drive gear and shear pin were intact. No fuel was noted in the pump upon hand rotation. The fuel inlet screen was dry.

The magnetos produced spark at all terminals upon hand rotation. The sparks plugs, a mix of

fine wire and massive electrodes, had a dry, gray appearance.

The wing fuel filler assembly from each wing was removed. Hand examination of the interior fuel bladder of the wings revealed the presence of several small wrinkles along the bottom of each bladder. The wrinkles were oriented diagonally from the inboard area of each tank, toward the outboard, aft edge of each tank. A small amount fuel was noted in each fuel bladder on the aft side of the wrinkles.

A small amount of blue-colored fuel was drained from the right wing fuel drain sump valve. The fuel sample contained a small amount of dark particles. No fuel was obtained from the left wing fuel drain sump valve.

The fuel selector valve was positioned on the BOTH setting. Removal of fuel lines from the wing fuel tanks, to the selector valve, revealed a small amount of fuel in the lines, up to the valve. No fuel was found in the fuel lines from the selector valve to the engine.

The airplane's header tank was empty except for about an ounce of a clear fluid that was a mix of fuel and water.

The gascolator was empty of any fuel. It contained about one teaspoon of water. The interior of the gascolator housing contained dark particles. The gascolator screen contained similar dark particles.

Disassembly of the fuel manifold revealed a small amount of fuel in the housing. The diaphragm was intact. The screen was free of contaminants.

The accident airplane was equipped with a fuel totalizer. The face of the instrument sustained impact damage during the accident sequence, but otherwise, appeared undamaged. The totalizer was removed from the instrument panel, and a 12 volt electrical current was hooked to its electrical contact points. When the function of "Gallons Remaining" was selected, it displayed 29.6 gallons.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination of the pilot was conducted under the authority of the Alaska State Medical Examiner, 5700 E. Tudor, Anchorage, Alaska, on August 10, 2001. The cause of death for the pilot was attributed to multiple blunt force impact.

A toxicological examination was conducted by the FAA's Civil Aeromedical Institute (CAMI) on October 29, 2001, and was negative for any alcohol or drugs.

ADDITIONAL INFORMATION

The pilot operated the accident airplane from a lake located at his residence. The pilot fueled

his airplane from a 1,000 gallon metal tank located adjacent to the lake. A family member reported that the metal fuel tank had been installed at least 15 years before the accident. Following the examination of the airplane wreckage on August 24, the NTSB IIC inspected the owner's fuel tank. The tank rested on the ground and was equipped with a filler pipe and cap, a vent pipe and cap, and a stand-pipe into which a hand pump was installed. The hand pump is equipped with a filter housing, a long rubber hose, and a small metal nozzle. The tank did not have a visible bottom drain. The fuel filter, attached to the hand pump housing, consisted of a plastic housing, and a paper filter element. The plastic filter housing had an opaque appearance, and it was equipped with a screw-type drain at the bottom. The filter housing was empty of any fluid. At the bottom of the interior of the plastic filter housing, a small amount a fine brown particles were noted. The filter element, a National Spencer Inc., #20 Element, was dry.

A family member provided a large jar containing fluid that he drained from the fuel tank filter housing after the accident. The fluid had fine, light-tan colored particles suspended in the fluid. Allowing the fluid sample to settle for several minutes revealed a clear liquid above a bottom layer of particles. The clear liquid had an odor of gasoline. A test of the liquid for the presence of water, utilizing a water testing paste, was negative.

An examination of fuel purchase records revealed that 751.3 gallons of 100LL aviation fuel was delivered to the owner's fuel tank on March 20, 2000. It is unknown if that purchase filled the tank. Prior to the accident flight, the pilot purchased $35.29 of fuel at the Wasilla Airport, Wasilla, Alaska. A family member found two empty five-gallon plastic fuel containers sitting on the owner's dock, at Memory Lake from which he operated the airplane.

WRECKAGE RELEASE

The Safety Board did not take custody of the wreckage. No parts or components were retained by the Safety Board.

Pilot Information

Certificate:	Private	**Age:**	36,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	August 15, 2000
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 20, 2001
Flight Time:	981 hours (Total, all aircraft), 29 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N4849C
Model/Series:	185	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	18502617
Landing Gear Type:	Float	**Seats:**	4
Date/Type of Last Inspection:	September 1, 2000 Annual	**Certified Max Gross Wt.:**	3350 lbs
Time Since Last Inspection:	32 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2354 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	IO-520-D
Registered Owner:	CURTIS C. MENARD	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PANC,152 ft msl	**Distance from Accident Site:**	42 Nautical Miles
Observation Time:	16:53 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Few / 3000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 5500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	147°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.21 inches Hg	**Temperature/Dew Point:**	19°C / 9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	WASILLA, AK	**Type of Flight Plan Filed:**	None
Destination:	TYONEK, AK	**Type of Clearance:**	None
Departure Time:	15:45 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	61.385276,-151.38916

Administrative Information

Investigator In Charge (IIC):	Erickson, Scott
Additional Participating Persons:	WILLIAM BOHMAN; FAA-AL-ANC FSDO 03; ANCHORAGE, AK TODD SIGLER; CESSNA AIRCRAFT COMPANY; WICHITA, KS JOHN KENT; TELEDYNE CONTINENTAL MOTORS; SEAGOVILLE, TX
Original Publish Date:	July 25, 2002
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=53030