Aviation Investigation Final Report

Location:	Whittier, Alaska	**Accident Number:**	ANC15FA021
Date & Time:	April 14, 2015, 13:30 Local	**Registration:**	N9247C
Aircraft:	Cessna 180	**Aircraft Damage:**	Substantial
Defining Event:	Fuel related	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was conducting a personal cross-country flight in instrument meteorological conditions. The airplane was not certificated for flight into icing. A review of radar data and radio communications recordings revealed that, after an air traffic controller issued the pilot a descent from 10,000 to 8,000 ft mean sea level (msl), the pilot reported that he was having engine trouble and had encountered possible icing. The pilot subsequently declared an emergency, and 3 minutes later, radar contact and communication with the airplane were lost. A day after the accident, search and rescue personnel found the remains of the pilot along the eastern shoreline of Culross Island. The left main landing gear strut and tire were also recovered. The rest of the airplane was not located, and it is presumed to have sunk in Prince William Sound.

A review of weather information revealed that marginal visual flight rules conditions prevailed along the flight route due to low ceilings and that occasional instrument meteorological conditions (IMC) prevailed due to low ceilings and visibility in snow showers. Moderate icing was forecast between 4,000 and 10,000 ft above ground level. It is likely that the airplane encountered IMC and potential icing conditions below 10,000 ft msl. A pilot in an airplane about 6 minutes behind the accident airplane reported that, before descending from about 9,500 ft msl, he noticed a slight buildup of ice on the left engine cowling. Given this statement, the weather reports, and the accident pilot's report that he was having engine trouble, it is likely that the airplane flew through an area favorable for the formation of induction or carburetor icing, which resulted in a total loss of engine power.

A mechanic reported that the pilot had told him that when he applied carburetor heat, the control felt "mushy." The mechanic instructed the pilot to inspect the control arm for any damage because it could prevent the carburetor heat from operating correctly. Before the accident flight, the mechanic sent a text message to the pilot asking if he had checked the carburetor heat control, and the pilot replied that he had not but would do it that day. Therefore, although it is possible that damage to the carburetor heat control arm may have limited the amount of carburetor heat available to eliminate any possible carburetor ice, it could not be determined if this occurred because the airplane could not be examined.

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 flight into known icing conditions, contrary to the airplane's limitations, which resulted in a total loss of engine power due to icing.

Findings

Environmental issues	Conducive to carburetor icing - Effect on equipment
Environmental issues	Conducive to carburetor icing - Decision related to condition
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Enroute-descent	Fuel related (Defining event)

On April 14, 2015, about 1330 Alaska daylight time (AKD), a wheel-equipped Cessna 180 airplane, N9247C, is presumed to have sustained substantial damage during impact with ocean waters, about 18 miles east of Whittier, Alaska, following a reported loss of engine power. The airplane was being operated as an instrument flight rules (IFR) cross-country personal flight under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91, when the accident occurred. The instrument rated private pilot, the sole occupant of the airplane, sustained fatal injuries. Instrument meteorological conditions (IMC) prevailed along the route of flight, and the airplane was operating on an IFR flight plan. The flight departed the Wasilla Airport, Wasilla, Alaska, about 1205, en route to the Valdez Airport, Valdez, Alaska.

According to a family member the purpose of the flight was for the pilot to attend a business meeting.

The airplane was equipped with a Spidertracks flight tracking system, which provides real-time aircraft flight tracking data. The flight tracking information is transmitted via Iridium satellites to an internet based storage location, at 2-minute intervals. The airplane's last known location was near the eastern shoreline of Culross Island, at an altitude of 69 feet, traveling at 80 knots, on a heading of about 270 degrees.

An alert notice was issued by the Federal Aviation Administration (FAA) Kenai Flight Service Station at 1336 and a search was conducted by personnel from the U.S. Coast Guard, Alaska State Troopers, and Alaska Air National Guard, as well as a Good Samaritan vessel.

On April 15, about 1700, searchers located the remains of the pilot along the eastern shoreline of Culross Island. Also recovered was the left main landing gear strut and tire belonging to the accident airplane. The rest of the airplane has not yet been located, and it is presumed to have sunk in the ocean waters of Prince William Sound.

Pilot Information

Certificate:	Private	**Age:**	53
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Unknown
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	August 6, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1605 hours (Total, all aircraft), 1561 hours (Pilot In Command, all aircraft)		

The pilot, age 53, held a private pilot certificate with airplane single engine land rating and instrument rating. His most recent third-class medical certificate was issued on August 06, 2013, and contained the limitation that he must wear corrective lenses for distant vision and possess glasses for near vision.

No personal logbooks were located for the pilot but according to a copy of FAA Form 8710-1, Airman Certificate and/or Rating Application, located at the home of the pilot, he had accumulated about 1605 total flight hours in airplanes as of July 11, 2014.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N9247C
Model/Series:	180	**Aircraft Category:**	Airplane
Year of Manufacture:	1955	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	31346
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	August 15, 2014 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	53 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	8281.5 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-470 SERIES
Registered Owner:	DALE A. CARLSON	**Rated Power:**	225 Horsepower
Operator:	DALE A. CARLSON	**Operating Certificate(s) Held:**	None

The airplane was a Cessna 180, manufactured in 1955, and equipped with a Continental Motors O-470 series engine. The airplane was certified and current for flight under instrument flight rules, but was not certified for flight into known icing.

The colors of the airplane included a primary base color of white with blue and gold accent lines, white wings, and a blue propeller spinner.

At the time of its last annual inspection, completed on August 15, 2014, the airplane had 8,281.5 hours in service.

In a statement to the National Transportation Safety Board (NTSB) investigator-in-charge, a mechanic said the pilot discussed that when he applied carburetor heat, the control felt "mushy." The mechanic instructed him to inspect the control arm (item 34 in the Cessna Illustrated Parts Catalog) on the air box for any damage as it could prevent the carburetor heat from operating correctly. About 0830 on the day of the accident, the mechanic sent a text message to pilot to ask if he had checked the carburetor heat control, to which the pilot replied that he had not, but would do it that day.

The Cessna 180 Owner's Manual states, in part: "The carburetor air heat control is located to the left of the throttle. The push-pull control operates the carburetor air intake butterfly valve which proportions the hot and cold air entering the carburetor. Pulling the control out provides heated air for the carburetor while pushing the control all the way in provides only cold air for the carburetor."

A detailed diagram of the engine air intake system from the Cessna Illustrated Parts Catalog is located in the public docket for this accident.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	PATO,103 ft msl	**Distance from Accident Site:**	22 Nautical Miles
Observation Time:	20:53 Local	**Direction from Accident Site:**	283°
Lowest Cloud Condition:		**Visibility**	0.25 miles
Lowest Ceiling:	Indefinite (V V) / 500 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots / 26 knots	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	120°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.54 inches Hg	**Temperature/Dew Point:**	0°C / -2°C
Precipitation and Obscuration:	Moderate - None - Fog		
Departure Point:	WASILLA, AK (IYS)	**Type of Flight Plan Filed:**	IFR
Destination:	VALDEZ, AK (VDZ)	**Type of Clearance:**	IFR
Departure Time:		**Type of Airspace:**	Class E

The forecast for the Portage Glacier area was for Marginal Visual Flight Rules conditions to prevail due to low ceilings and occasional IFR conditions due to low ceilings and visibility in snow showers. Moderate icing was forecasted between 4,000 feet agl and 10,000 feet agl with the freezing level beginning about 1,000 feet agl.

The closest weather reporting facility is Portage Glacier, Alaska, about 34 miles west of the accident site. At 1253, an aviation routine weather report (METAR) from the Portage Glacier Automated Surface

Observation System (ASOS) was reporting in part: wind from 120° at 11 knots, gusting 26 knots; sky condition, vertical visibility 500 feet agl; visibility, 1/4 statute miles; temperature 32 degrees F; dew point 28 degrees F; altimeter, 29.54 inHg.

A detailed weather study is located in the public docket for this accident.

Airport Information

Airport:	VALDEZ PIONEER FIELD VDZ	**Runway Surface Type:**	Asphalt
Airport Elevation:	121 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	06	**IFR Approach:**	LDA
Runway Length/Width:	6500 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	Unknown
Ground Injuries:	N/A	**Aircraft Explosion:**	Unknown
Total Injuries:	1 Fatal	**Latitude, Longitude:**	60.707221,-148.103607(est)

The only wreckage recovered to date is the left main landing gear strut and tire. The strut separated from the airplane with the gear box still attached. Sharp angular fractures exist on the forward and aft surface. The inboard surface separated at the rivet line with the outboard surface exhibiting a flat fracture surface. The fractures are consistent with damage that would occur during an impact sequence as opposed to tidal activity and impact with underwater objects after submersion.

Corrosion is present on the entire structure consistent with exposure to salt water.

Communications

A post accident review of archived FAA radar data and radio communication recordings revealed that, about 1315, the on-duty Anchorage (ZAN) Air Route Traffic Control Center (ARTCC) radar controller cleared the airplane for the LDA/DME H instrument approach to the Valdez Airport (VDZ). The airplane was about 60 miles southwest of VDZ, at an altitude of about 10,000 feet mean sea level (msl). Shortly after the pilot began a descent from 10,000 feet msl to 8,000 feet msl, he advised the ARTCC controller of an engine problem.

As a result of static and background noise on the air traffic recording, a variety of filters were applied to clarify the audio by the NTSB Vehicle Recorders Laboratory in Washington, DC. The transcription from that recording can be found in the public docket for this accident.

At 1316, after determining from the pilot that he did not have the VDZ weather, the ZAN controller issued the 1256 weather observation. One minute later, he cleared N9247C for the LDA/DME-H approach to VDZ with a restriction to cross the PEPPI intersection at or above 8000 feet. At 1318, the pilot reported leaving 10,000 feet for 8,000 feet.

At 1319, the pilot of N9247C stated that he was having trouble with his engine, but the transmission was blocked by other aircraft on the frequency. The controller acknowledged N9247C's descent from 10,000 to 8,000 feet, but did not acknowledge the pilot's report of engine trouble.

At 1321, the pilot transmitted, "Four seven charlie is declaring an emergency I have a problem with my engine I think I've been through the light stuff (unintelligible) descending for PEPPI for four thousand." The controller acknowledged the emergency call, then asked the pilot for the number of souls on board and if his engine was out or if he was able to continue. The pilot responded, "…I have windmilling power and (unintelligible) I'm in pretty poor shape. I still maintain forward airspeed. Descending for PEPPI at four thousand."

The controller replied, "…Roger, you're coming in a little bit scratchy right now. Right now I am showing you over an island you're about to head out over a little bit of water uh are you going to try to continue to Valdez or somewhere else along your route?" The pilot responded that he was going to try to get below the cloud deck at his current location, circle over the island, and see if he had room to land on the beach. The controller acknowledged and asked again how many souls were on board the aircraft. The pilot responded that one soul was on board.

At 1323, the controller advised the pilot that he was no longer in radar contact but that he was last observed northeast bound with the island behind him. The pilot acknowledged with "four seven charlie copy." There were no further communications between N9247C and air traffic control (ATC).

At 1325, Empire 922, an ATR-42-300, heard transmissions from N9247C. They relayed to the ZAN controller that the accident airplane reported that he was at 5500, had not broken out of the clouds and the prop was wingmilling, having not fired yet. The controller advised Empire 922 that he could not hear N9247C and asked the crew to continue relaying N9247C's transmissions. They agreed to do so.

At 1325, the ZAN controller asked Yukla 02, an E3 airborne early warning and control system (AWACS) aircraft, if they could help locate a mode 3 transponder code of 2221, the transponder code assigned to N9247C, at their 4 o'clock position and 40 miles at low level. Yukla 02 advised that they would help out.

At 1330, the pilot of Empire 922 advised the controller that he was receiving a strong emergency locator transmitter (ELT) signal on frequency 121.5. The ZAN controller acknowledged Empire 922 and relayed to Juneau (JNU) FSS that N9247C had "crash landed." The ZAN controller asked the JNU controller if JNU was in contact with any other aircraft or helicopters in the area that could assist, but there were none.

At 1331, the controller asked Empire 922 to attempt to establish communications with the pilot of N9247C via the emergency frequency [121.5]. At 1332, Empire 922 advised ATC that they had not re-established communications with N9247C and that they were no longer hearing the ELT. Two minutes later, Empire 922 advised ATC that they had tried to reach N9247C on frequency 121.5 without success.

No further radio transmissions were received from the airplane and an emergency locator transmitter (ELT) signal was broadcasting shortly thereafter for about 20 seconds.

A detailed air traffic aircraft accident package is located in the public docket for this accident. A NTSB detailed air traffic control study is also located in the public docket for this accident.

Medical and Pathological Information

The FAA Civil Aeromedical Institute performed toxicology examinations for the pilot on May 08, 2015, which were negative for alcohol and drugs.

A postmortem examination conducted by the Alaska State Medical Examiners Office attributed the cause of death to be drowning with contributing factors of hypothermia and blunt force head injury.

Survival Aspects

The accident took place about 1330 AKD and originally the search was focused on the east side of Perry Island, as that is where the last radar return was observed. About 1440, the search was refocused to the east side of Culross Island, about 7 nautical miles west of Perry Island after receiving the last known coordinates from the Spidertracks data.

The conditions of Prince William Sound at the time and location of the accident was water temperature 42 degrees F with 1-4 foot seas. When the pilot was located on Culross Island, it was noted that he was not wearing a life jacket or other personal floatation device.

A February 2008 NATO Research and Technology Organization publication titled *Survival at Sea for Mariners, Aviators and Search and Rescue Personnel* described the four stages of cold water immersion as:

- Stage 1: Initial immersion responses or cold shock (3-5 min.)
- Stage 2: Short-term immersion or swimming failure (5-30 min.)

- Stage 3: Hypothermia (≥ 30 min.)
- Stage 4: Post-rescue collapse or circum rescue collapse

In this publication, it is stated that during stage 1, "death from cold shock is not uncommon," and it takes place "within 3-5 minutes of immersion." It further states that swimming in "cold, dense water" is very dangerous (stage 2). As the body becomes exhausted, the person transitions to a more vertical position before total submersion.

A US Coast Guard article from January 6, 2015, titled *A Lifejacket Buys You Time,* states that it takes at least an hour for the full effects of hypothermia to set in and another hour after loss of consciousness for the heart to stop. It further states that without a lifejacket or other flotation device, drowning will occur prior to death from hypothermia.

A new Ameri-King Corporation AK-451 406MHz emergency locator transmitter (ELT) was installed in the airplane on February 04, 2015. The ELT is designed to transmit GPS/NAV data immediately on 406MHz, 243MHz and 121.5MHz frequencies. The 406MHz is stated to last for 24 hours with the 243MHz and 121.5MHz lasting a total of at least 78 hours. Shortly after the last communication was received from N9247C, an ELT began broadcasting a signal on 121.5MHz. Based on the Spidertracks data, the ELT was activated in the air with the signal broadcasting for about 20 seconds before it was no longer received. The Alaska Rescue Coordination Center (AKRCC) reported never receiving a 406MHz signal. Currently, ELTs are not certified, nor required to be certified, for operation during or after submersion.

Additional Information

A pilot in an airplane about 6 minutes behind the accident airplane stated that while at 9,500 feet msl, in-flight visibility varied between 1 and 10 miles and was restricted by suspended ice crystals. The temperature was about 0°F. The pilot stated that prior to descending from 9,500 feet msl, he noticed a slight build-up of ice on the left engine cowling.

Administrative Information

Investigator In Charge (IIC):	Williams, David
Additional Participating Persons:	Hugh Youngers; FAA; Anchorage, AK
Original Publish Date:	May 16, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=91030