



National Transportation Safety Board Aviation Accident Final Report

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| Location: | Ketchikan, AK | Accident Number: | ANC08LA095 |
| Date & Time: | 08/01/2008, 1906 AKD | Registration: | N59214 |
| Aircraft: | CESSNA T210 | Aircraft Damage: | Substantial |
| Defining Event: | Fuel exhaustion | Injuries: | 1 Minor, 1 None |
| Flight Conducted Under: | Part 91: General Aviation - Personal | | |

Analysis

The private pilot departed on an instrument flight rules (IFR), personal, cross-country flight after requesting that his airplane's fuel tanks be filled. The destination airport was about 521 nautical miles away. IFR conditions prevailed along the en route portion of the flight, but visual conditions prevailed at the destination airport. The airplane's fuel capacity was 90 gallons, and the engine consumed about 16.5 gallons per hour. The airplane was in cruise flight above the clouds and the pilot requested a visual approach from the south when he was about 19 miles southeast of the destination airport. The airport does not have terminal radar coverage, and is served by a flight service station. The request for a visual approach was not approved due to mountain obscuration south of the airport. The pilot was cleared for the ILS distance measuring equipment (DME) approach. The pilot was initially uncertain of his approach options, which included a radial transition to the localizer, outbound on the localizer with a procedure turn, or a no-procedure turn at 40 DME. He eventually understood and accepted the radial transition clearance, which required him to intercept the localizer course inbound on a 35-mile DME arc. As the airplane approached the inbound localizer heading, the pilot did not make the inbound turn. Air Route Traffic Control Center and Flight Service Station (FSS) personnel made various attempts to contact the pilot to request that he execute a missed approach procedure, but there was no immediate response. The pilot eventually reported that he had descended into visual conditions, but indicated that he was not sure where he was in relation to the airport. He determined his position and began to fly toward the airport at 3,000 feet. Communication with the airplane was garbled and broken for a short while since the airplane was now about 27 miles west of the airport. FSS personnel requested assistance from other airplanes in the area to locate the accident airplane and relay radio communications. About 7 minutes before the accident, the pilot radioed that he was low on fuel and probably would not make it to the airport. He ditched the airplane about 5.4 miles west-northwest of the airport after his fuel supply was exhausted. The pilot and the sole passenger escaped the sinking airplane and were rescued by a float-equipped airplane that had responded to the FSS request for assistance. The pilot reported that he missed the inbound turn onto the localizer because his autopilot failed to capture the localizer. He also said that during the flight headwinds were greater than expected, the cloud ceiling at the destination airport was lower than expected, and the fuel vendor at the departure airport may have not completely filled the

fuel tanks to their maximum capacity. The pilot said that he did not visually inspect the fuel tanks prior to departure and that there was no mechanical malfunction of the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to ensure that there was sufficient fuel on board the airplane for the planned flight, and his inadequate flight planning and navigation, which resulted in fuel exhaustion and ditching short of the planned destination. Contributing to the accident was the pilot's geographic disorientation during his approach to the airport.

Findings

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| Aircraft | Fuel - Fluid level (Cause) |
| Personnel issues | Geographic disorient (lost) - Pilot (Factor) Flight planning/navigation - Pilot (Cause) |
| Environmental issues | Water - Contributed to outcome |

Factual Information

On August 1, 2008, about 1906 Alaska daylight time (ADT), a Cessna T210 airplane, N59214, sustained substantial damage when it ditched in the ocean following a complete loss of engine power, about 5.4 miles west-northwest of Ketchikan, Alaska. The airplane was being operated as an instrument flight rules (IFR) cross-country personal flight under Title 14, CFR Part 91, when the accident occurred. The airplane was operated by the private certificated pilot who was not injured. The sole passenger received minor injuries due to hypothermia. Instrument meteorological conditions prevailed for the en route portion of the flight, but visual conditions prevailed at the Ketchikan International Airport. An IFR flight plan was filed by the pilot for the flight that departed Bellingham, Washington, about 1530 pacific daylight time (1430 ADT).

According to Federal Aviation Administration (FAA) personnel, and from a review of air to ground communication recordings between the accident airplane and FAA air traffic control facilities by the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), the pilot contacted the FAA's Air Route Traffic Control Center (ARTCC) about 34 miles south of the Annette Island VOR, which is about 19 miles southeast of Ketchikan. The pilot requested a descent from 12,000 feet to 4,000 feet, but the ARTCC controller said that the lowest altitude he could give in that area was 8,000 feet, direct to the Annette Island VOR. The pilot requested a visual approach to runway 29, and commented that 8,000 feet would put him in instrument meteorological conditions (IMC), but he acknowledged the clearance.

The ARTCC controller then conferred with the Ketchikan Flight Service Station (FSS) about the possibility of a visual approach from the south to runway 29. The FSS specialist reported that the mountain tops at the south end of Annette Island were obscured by clouds, and suggested that the instrument landing system (ILS) or the area navigation (RNAV) global positioning system (GPS) approach to runway 11, would be the best.

The ARTCC controller then told the pilot that the lowest altitude he could give was 7,000 feet until Annette Island, and then to 6,500 feet after the VOR. The pilot elected to make the ILS, distance measuring equipment (DME) approach to runway 11 at Ketchikan with a circle to land on runway 29. He was cleared for the ILS DME-1 approach about 1814.

The ILS DME-1 approach to runway 11 has an initial approach fix on the 295 degree radial from Annette Island at 35 DME, and maintains a 35 DME arc until joining the inbound course for the ILS, on a 109 degree heading. The arc does not have a procedure turn. A second approach option is to join the outbound localizer course on a 289 degree heading, and has a procedure turn at 17 DME before proceeding inbound. A third approach option is to proceed to the initial approach fix at DOOZI, which is 40 DME from Annette Island.

The ARTCC controller inquired from the pilot about his plans for the approach by stating, "N59214, are you expecting the 295 radial transition." The pilot replied that he was expecting to go to the initial approach fix at DOOZI. The ARTCC controller again inquired, "After Annette Island VOR, are you going to try the Annette 295 radial, out for the arc, or are you going to go over toward the localizer for the procedure turn." The pilot replied that he was planning to go direct to DOOZI at 8,200 feet, but seemed uncertain about his approach options. The ARTCC controller stated, "N59214, over Annette Island VOR, as initial approach fix, you can use the 295 radial for the arc, or there is another radial you can use to go out and join the localizer, and track outbound for the procedure turn. The pilot replied, "We're looking, Oh I see it, you want us to set up 295 outbound for [unintelligible]." The ARTCC controller replied, "affirmative."

As the accident airplane neared the ILS localizer, the pilot was advised by ARTCC personnel to contact the Ketchikan FSS and radar services were terminated. The pilot made radio contact with Ketchikan FSS at 1843 and said that he was on the ILS approach, and about 30 seconds from turning final, about 17 miles from the airport. The FSS specialist advised the pilot to "report the 11 DME fix."

About 1846, ARTCC personnel noticed that the airplane did not turn onto the localizer, and was continuing away from the airport. The FSS specialist contacted the pilot who said he must have gone through the localizer and inquired whether the FSS had radar coverage, which the FSS specialist replied, "negative, I do not." The FSS specialist advised the pilot to execute the missed approach procedure immediately, saying "there's mountains in these clouds." There was no immediate reply from the pilot, but an unidentified voice was heard on the FSS radio frequency saying, "burning up fuel that we don't really have." The FSS specialist then told the pilot to switch back to the ARTCC radio frequency, and to climb and maintain 7,000 feet. The FSS specialist indicated that it might be possible to get a lower altitude near the VOR and into VFR conditions. The pilot acknowledged the frequency change, and stated he was at 7,300 feet.

The pilot did not contact ARTCC, and about 1850, the FSS specialist called the pilot on the FSS frequency to advise the pilot to maintain 6,500 feet and contact ARTCC. The pilot stated that he was below the clouds and he would watch out for mountains. The FSS specialist confirmed the pilot was in VFR conditions, and asked the pilot if he wanted to cancel his IFR clearance, to which he stated "affirmative."

The FSS specialist was concerned about the pilot's location, and asked, "Do you know where you are in relationship to the airport." The pilot replied, "not really, but we are going to [unintelligible] in the GPS in a second here." The FSS specialist made several additional calls to the pilot, but there was no response. At 1855, the FSS specialist asked the ARTCC if they still had radar contact with the accident airplane, to which they replied no, but the last position before loss of radar contact was about 30 miles on the 280 degree radial from Ketchikan, headed toward the airport.

The FSS specialist continued to attempt radio contact with the pilot, and about 1856, he asked a float-equipped airplane, N08Q, to look for the accident airplane, and to assist in relaying radio messages between the FSS and the accident pilot. The accident pilot's radio messages were being received by the FSS as broken and garbled, and the pilot of N08Q relayed that the accident pilot was 27 DME west, inbound to Ketchikan on a 093 degree heading toward the airport. The FSS specialist asked N08Q and several other float-equipped airplanes to begin looking for the accident airplane.

About 1859, the pilot reported to the FSS that he was level at 3,000 feet, over the water, and was low on fuel. About 1902, the pilot said that the engine had stopped running. He said that he was 16.3 miles from the airport, and had switched from the right fuel tank to the left tank, which was "flat." The pilot continued to report his status by stating he was at 3,400 feet, but it "does not look good, I think we are going to lose it." He next reported that he was on a 080 degree heading at 15.1 miles, with a desired GPS track of 093 degrees to the airport.

The FSS specialist continued to inquire about the status of the accident airplane, and the pilot reported that he had civilization in sight about 6 to 7 miles ahead of the airplane. When the FSS specialist next checked with the pilot about his status, he reported that he was continuing toward the airport, but he probably was too low to make it around a peninsula that was visible

ahead. He then said he was at 1,000 feet, and he would call immediately if the engine quit.

At 1906, the pilot reported that he was 7.5 miles from the airport, had turned to a heading of 060 degrees to avoid hitting little islands ahead. He then said that he saw civilization and smoke ahead, and was "going in."

About 1909, the pilot of N08Q reported that he had spotted the accident airplane near Vallenar Point at the north end of Gravina Island, nose down in the water, and stated that he was landing to assist.

About 1911, the pilot of N08Q said that he saw two persons swimming to shore. He was able to get the accident pilot and passenger aboard his airplane, and flew to Ketchikan where they were met by an ambulance. The airplane subsequently sank in about 50 feet of water.

During a telephone conversation with the NTSB IIC, on August 5, the pilot reported that he requested a fuel vendor at the Bellingham Airport to fill the airplane fuel tanks, and he received a weather briefing from the Seattle Automated Flight Service Station (AFSS), which included a winds aloft forecast. After departure, the pilot said that during the flight, headwinds were greater than expected, and the cloud ceiling at Ketchikan was lower than expected. He also said that the fuel vendor may have not completely filled the fuel tanks to their maximum capacity.

The pilot said that his airplane has a fuel capacity of 90 gallons, and usually burns between 16 to 17 gallons per hour. He used a cruise altitude of 12,000 feet, his total flight time for the accident flight was 4 hours and 15 minutes, and his usual ground speed of about 160 knots was as low as 143 knots. He indicated that during the approach to Ketchikan, his autopilot system was coupled to the GPS receiver, but as the airplane approached the localizer heading, the autopilot failed to capture the localizer and initiate a turn on course. Consequently, the airplane flew through the localizer, which prompted ARTCC to request a climb. The pilot reported that he was low on fuel, and saw an opening in the clouds. He descended into visual conditions, and flew toward the airport, but the engine lost power. He selected an emergency landing spot in the water, just off the north end of Gravina Island. He and his passenger were rescued by other airplanes.

In the Pilot/Operator Aircraft Accident Report (NTSB Form 6120.1) submitted by the pilot, the pilot estimated that the airplane received between 82 to 84 gallons of fuel before departure. He indicated that in the future, he would "stay with the airplane while it is being fueled to use his ladder to check visually to be certain the fueler has fully topped both tanks." In addition, the pilot noted that the airplane did not have a mechanical malfunction or failure.

Aircraft and Flight Information

The straight-line distance between Bellingham, Washington, and Ketchikan, Alaska, without any maneuvering turns, is about 521 nautical miles. The accident airplane's Pilot's Operating Handbook (POH) was reviewed by the NTSB IIC, and the following data was noted for a no-wind condition at 12,000 feet, with a 45 minute reserve at 45 percent power:

The airplane's range at 65 percent power was about 890 nautical miles. At 70 percent power, the range was about 860 nautical miles.

At 65 percent power, the airplane POH listed a speed of about 168 knots, with an endurance of about 5 hours and 30 minutes, and consuming about 14.2 gallons per hour.

At 70 percent power, the POH listed a speed of about 173 knots, with an endurance of about 5

hours and 6 minutes, and consuming about 15.5 gallons per hour.

At 168 knots, the airplane would cover 521 miles in about 3 hours and 8 minutes. At 143 knots, which the pilot said he flew, the airplane would cover 521 miles in about 3 hours and 38 minutes.

Using the speed of 143 knots provided by the pilot, and using a fuel consumption rate of 16.5 gallons per hour, also provided by the pilot, the airplane would have consumed 90 gallons of fuel in about 5 hours and 27 minutes.

Weather Data

The area forecast for southern, southeast Alaska, issued at 1145 and valid until 2400, was indicating, in part: Synopsis, valid until August 2, at 0600; High pressure ridge persists over eastern Gulf of Alaska and southeast Alaska panhandle through 2400. AIRMET Sierra was issued for mountain obscuration, and mountains occasionally obscured in clouds, and was valid until 1800. Clouds and weather: 2,500 feet scattered, 4,500 feet broken with layers above. Tops at 20,000 feet. Occasionally, 2,500 feet broken, 4,500 feet overcast. Turbulence, nothing of significance. Icing and freezing level, nothing of significance. Freezing level, 7,000 feet.

The winds aloft forecast for the accident route of flight at 12,000 feet msl, based on data that was for use between 1300 and 2200 on August 1, was reporting, in part:

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| Vancouver International Airport, Canada | 310 degrees (true) at 10 knots |
| Seattle, Washington | 250 degrees (true) at 30 knots |
| Port Hardy, Canada | 330 degrees (true) at 15 knots |
| Sandspit, Canada | 320 degrees (true) at 15 knots |
| Annette Island, Alaska | 330 degrees (true) at 15 knots |

The terminal forecast for Ketchikan, valid between 1600 on August 1, and 1600 on August 2, was reporting, in part: Wind, 330 degrees at 6 knots, visibility greater than 6 statute miles; clouds and sky condition, 4,000 feet broken, 6,000 feet overcast.

At 1853, an aviation routine weather report (METAR) at Ketchikan was reporting, in part: Wind, 350 degrees (true) at 5 knots; visibility, 10 statute miles; clouds and sky condition, few at 2,500 feet, 3,500 feet broken, 4,500 feet overcast; temperature, 57 degrees F; dew point, 52 degrees F; altimeter, 30.01 inHg; remarks, rain began 15 minutes past the hour and ended 26 minutes past the hour, harbor wind 280 degrees at 10 knots.

History of Flight

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| Approach-IFR initial approach | Miscellaneous/other |
| Approach | Fuel exhaustion (Defining event) Ditching |

Pilot Information

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| Certificate: | Private | Age: | 66, Male |
| Airplane Rating(s): | Single-engine Land | Seat Occupied: | Left |
| Other Aircraft Rating(s): | None | Restraint Used: | Seatbelt, Shoulder harness |
| Instrument Rating(s): | Airplane | Second Pilot Present: | No |
| Instructor Rating(s): | None | Toxicology Performed: | No |
| Medical Certification: | Class 3 With Waivers/Limitations | Last Medical Exam: | 08/28/2007 |
| Occupational Pilot: | No | Last Flight Review or Equivalent: | 08/29/2007 |
| Flight Time: | 2652 hours (Total, all aircraft), 2485 hours (Pilot In Command, all aircraft) | | |

Aircraft and Owner/Operator Information

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| Aircraft Manufacturer: | CESSNA | Registration: | N59214 |
| Model/Series: | T210 | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | No |
| Airworthiness Certificate: | Normal | Serial Number: | 21060164 |
| Landing Gear Type: | Retractable - Tricycle | Seats: | 3300 |
| Date/Type of Last Inspection: | 09/12/2007, Annual | Certified Max Gross Wt.: | |
| Time Since Last Inspection: | 82 Hours | Engines: | 1 Reciprocating |
| Airframe Total Time: | 3248 Hours | Engine Manufacturer: | Continental |
| ELT: | Installed, not activated | Engine Model/Series: | TS10-520H |
| Registered Owner: | Robert C. Davis | Rated Power: | 285 hp |
| Operator: | Robert C. Davis | Air Carrier Operating Certificate: | None |

Meteorological Information and Flight Plan

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| Observation Facility, Elevation: | PAKT, 88 ft msl | Observation Time: | 1853 ADT |
| Distance from Accident Site: | 5 Nautical Miles | Condition of Light: | Day |
| Direction from Accident Site: | 289° | Conditions at Accident Site: | Visual Conditions |
| Lowest Cloud Condition: | Few / 2500 ft agl | Temperature/Dew Point: | 14°C / 11°C |
| Lowest Ceiling: | Overcast / 4500 ft agl | Visibility | 10 Miles |
| Wind Speed/Gusts, Direction: | 5 knots, 350° | Visibility (RVR): | |
| Altimeter Setting: | 30.01 inches Hg | Visibility (RVV): | |
| Precipitation and Obscuration: | | | |
| Departure Point: | Bellingham, WA (KBLI) | Type of Flight Plan Filed: | IFR |
| Destination: | Ketchikan, AK (PAKT) | Type of Clearance: | IFR |
| Departure Time: | 1430 ADT | Type of Airspace: | |

Airport Information

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| Airport: | Ketchikan (PAKT) | Runway Surface Type: | |
| Airport Elevation: | | Runway Surface Condition: | |
| Runway Used: | N/A | IFR Approach: | ILS; VOR/DME |
| Runway Length/Width: | | VFR Approach/Landing: | Forced Landing |

Wreckage and Impact Information

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| Crew Injuries: | 1 None | Aircraft Damage: | Substantial |
| Passenger Injuries: | 1 Minor | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 1 Minor, 1 None | | |

Administrative Information

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| Investigator In Charge (IIC): | Scott R Erickson | Adopted Date: | 04/15/2009 |
| Additional Participating Persons: | Charles Wisner; FAA-AL-JNU FSDO 05; Juneau, AK | | |
| Publish Date: | 04/16/2009 | | |
| 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/ . | | |

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