Aviation Investigation Final Report

Location:	Yellow Pine, Idaho	**Accident Number:**	SEA07FA165
Date & Time:	June 14, 2007, 08:30 Local	**Registration:**	N6233E
Aircraft:	Cessna 172	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The day before the accident, the pilot and passenger had arrived in the airplane at a back country airport and set up camp with the intention of flying in the remote mountainous back country for several days. According to his logbook, this was the second time the pilot had made this type of trip, with the previous trip about 11 months prior. The purpose of the accident flight was to fly to another back country airport about 15 nautical miles to the north, have breakfast at a lodge, and then return. The pilot did not file a flight plan, and although the passenger thought other pilots knew their destination and intended time of return, this was not the case. The passenger stated that other airplanes departed first, and then they took off. She recalled that they were flying inside the canyon walls and made several turns. As they headed up a drainage, the pilot told her it was the "wrong drainage." The stall warning horn came on, and there was "no time or room to turn around." The airplane could not out climb the rising terrain and impacted the ground. The pilot sustained a skull fracture and died about 10 to 12 hours after the crash. The passenger's was injured but ambulatory, and stayed with the airplane to await rescue. A search for the airplane was not started until 2 days after the accident, when the caretaker at the departure airport noted that the couple's camping gear was still at the airport. The wreckage was located by an aerial search airplane 3 days after the accident. The accident site was about 8 nautical miles north of the departure airport, at an elevation of approximately 8,000 feet on the south side of an east-west ridgeline. Examination of the airframe and engine revealed no evidence of any malfunctions or failures that would have prevented normal operation. No emergency locator transmitter (ELT) signal was received from the airplane. The ELT was tested and found to function normally; the reason it did not activate upon impact could not be determined. The passenger reported that she was not aware of the location or function of the ELT, and therefore, she did not attempt to activate it manually. The passenger stated that there was a survival kit in the airplane, which she was aware of and made use of, during the 3 days she spent waiting for rescue.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's selection of the wrong routing through mountainous terrain and his failure to maintain adequate terrain clearance.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: MANEUVERING

Findings
1. (F) TERRAIN CONDITION - MOUNTAINOUS/HILLY
2. AIRCRAFT PERFORMANCE,CLIMB CAPABILITY - EXCEEDED
3. (C) IN-FLIGHT PLANNING/DECISION - INADEQUATE - PILOT IN COMMAND
4. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On June 14, 2007, approximately 0830 mountain daylight time, a Cessna 172, N6233E, impacted mountainous terrain while maneuvering near Yellow Pine, Idaho. The airplane sustained substantial damage, the private pilot was killed, and the passenger, who was the pilot's wife, received serious injuries. The pilot, who was the registered owner of the airplane, was operating it under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the planned personal cross country flight between two back country airports and no flight plan was filed. The flight departed from Johnson Creek Airport about 0815, and the intended destination was Big Creek Airport, located about 15 nautical miles to the north of Johnson Creek.

During a telephone interview conducted by the NTSB investigator-in-charge, the passenger reported that they had flown to Johnson Creek from their home near Willits, California, the day before the accident and set up camp at Johnson Creek with the intention of flying in the Idaho back country for several days. The purpose of the accident flight was to fly to Big Creek, have breakfast at a lodge there, and then return to Johnson Creek. She stated that the night before they had talked with other pilots around the camp fire at Johnson Creek, and she thought the other pilots knew they were going to fly to Big Creek in the morning.

The passenger stated that other airplanes departed first, and then they took off to go to Big Creek. The passenger recalled that they were flying inside the canyon walls and made several turns. As they headed up a drainage, the pilot told her it was the "wrong drainage." The stall warning horn came on, and there was "no time or room to turn around." The airplane could not out climb the rising terrain and impacted the ground.

The airplane was reported missing on June 16 about 1045 by the caretaker at Johnson Creek. The caretaker reported that the airplane had departed Johnson Creek about 1000 on June 14 for an unknown destination, possibly Thomas Creek, Indian Creek, Sulphur Creek or Moose Creek, and that the couple's camping gear was still at Johnson Creek. A search was initiated, and the wreckage was located by an aerial search airplane about 1540 on June 17. The accident site was located about 8 nautical miles north of Johnson Creek at an elevation of approximately 8,000 feet on the south side of an east-west ridgeline.

PERSONNEL INFORMATION

The pilot, age 55, held a private pilot certificate with an airplane single-engine land rating. His most recent medical certificate was a third class medical certificate issued on November 9, 2006, with the limitation, must have available glasses for near vision.

Review of the pilot's personal flight logbooks revealed that as of June 13, 2007, he had logged a total of 1,000 hours flight time of which 760 hours were in the same make and model as the accident airplane. The logbooks indicated the pilot had made one previous trip to the Idaho back country in the airplane; a series of entries dated July 23, 2005, to August 7, 2005, listed flights into several Idaho back country airports. An entry dated July 26, 2005, listed a flight of 0.4 hours duration between Johnson Creek Airport and Big Creek Airport.

AIRCRAFT INFORMATION

The 1959 model Cessna 172, S/N 46333, was powered by a 145-horsepower Continental O-300-A engine, S/N 14273-0-8-A. The most recent annual inspection was completed on July 3, 2006, at an airframe total time of 4,996 hours; as of this date, the engine had accumulated 765 hours since major overhaul.

The airplane was found equipped with an EBC-102A emergency locator transmitter (ELT) manufactured by the Emergency Beacon Corporation of New Rochelle, New York. No entry was found in the airplane's maintenance records documenting installation of the ELT. The maintenance records indicated that during the most recent annual inspection, a new ELT battery was installed (replacement due in July 2008) and the ELT was inspected in accordance with FAR 91.207 (D).

A copy of the installation instructions for the ELT was obtained from the manufacturer. The instructions stated in part, "the EBC-102A must be installed on the left side of the aircraft" and "must be vertical with as much as possible of the antenna visible through a window when viewed from outside the aircraft." The ELT was found mounted to the airplane's left cabin wall aft of the rear doorpost. It was mounted in a vertical position and the antenna was visible through the left rear cabin side window.

An entry in the airframe logbook dated July 10, 1996, stated "installed shoulder harness kit." A Federal Aviation Administration (FAA) Form 337 dated July 1, 1996, stated "installed Aero Fabricators Shoulder Harness and seat belt assembly per the manufacturers installation instructions AF-28 and STC SA1475GL." An entry in the airframe logbook dated January 13, 2005, stated "installed BAS Shoulder Harness in accordance with STC #SA2067NM." An invoice provided by BAS Incorporated showed that on December 9, 2004, the pilot purchased a standard inertial reel shoulder harness kit for "1 side only." The maintenance records did not specify at what station these shoulder harnesses were installed.

METEOROLOGICAL INFORMATION

At 0850, the recorded weather conditions at McCall Municipal Airport, McCall, Idaho, located about 26 nautical miles west of the accident site, were wind from 230 degrees at 3 Knots, sky clear, visibility 10 miles, temperature 12 degrees C, dew point 6 degrees C, and altimeter setting 30.08 inches Hg. The passenger reported that "clear weather" prevailed for the flight.

WRECKAGE AND IMPACT INFORMATION

Review of photos taken by salvage personnel revealed that the airplane came to rest at the edge of a rocky clearing on a heavily forested slope. The airplane's nose and the leading edges of both wings were embedded in the trees at the edge of the clearing. The tail cone of the airplane, which was partially separated aft of the baggage compartment and bent down, projected into the clearing. The nose landing gear separated from the fuselage and came to rest near the empennage. The right wing leading edge was crushed aft to the front spar from the lift strut attach point to the wingtip. The outboard one third of the left wing was bent down and twisted aft. All control surfaces remained attached to their respective attach points. Both flaps appeared to be in the full down position, and the flap handle appeared to be in the corresponding position.

The wreckage was examined by the NTSB IIC and an airframe manufacturer's representative after it was recovered from the accident site. The examination took place on June 28, 2007, at the facilities of Discount Aircraft Salvage in Deer Park, Washington. The forward lower left corner of the fuselage was crushed upward and rearward. The floor board was folded upward between the left side rudder pedals and the left front (pilot's) seat. The pilot's seat was in the full forward position and was jammed in place and could not be removed. The right front seat was not in place. The right seat tracks were damaged in a manner consistent with the seat having separated from the track during impact.

The left front (pilot's) station was equipped with a shoulder harness with an inertia reel mounted to the forward carry through spar and a seat belt mounted to the cabin floor. The attach points for the inertia reel and the seat belt remained intact. The webbing was cut in three places. When the webbing extending from the inertia reel was given a sharp pull by hand, the reel locked. Comparison of the pilot's station shoulder harness installation to installation instructions provided by BAS Incorporated indicated that the installation appeared to conform to the instructions.

The right front station (passenger's station) was equipped with a shoulder harness without an inertia reel and a seat belt mounted to the cabin floor. The attach points for the seat belt remained intact, and the webbing for the seat belt and shoulder harness remained intact. The shoulder harness attach point to the forward carry through spar failed. The shoulder harness was bolted with one AN4 bolt to a nut plate that appeared to have been attached to the carry through spar by two rivets. The nut plate was torn from the carry through spar. The rivets were not recovered. Examination of the carry through spar revealed that four holes had been drilled in the carry through spar where the nut plate was attached; proper attachment of the nut plate would have required only three holes, two for rivets and one for the bolt. Comparison of the passenger's station shoulder harness installation to installation instructions provided by Aero Fabricators and by BAS Incorporated indicated the installation did not conform to either set of instructions.

The engine remained attached to the airframe and the propeller remained bolted to the crankshaft flange. Both propeller blades displayed chordwise scratches, leading edge gouges and had curled tips.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy of the pilot was conducted by the Valley County Coroner's Office, McCall, Idaho, on June 19, 2008. The cause of death was determined to be blunt force trauma. The pathologist's findings included "a linear fracture beginning in the left temporal bone extending down across the base of the skull through the left anterior fossa" and "no fractures of the axial skeleton." Toxicology tests conducted by the FAA's Toxicology and Accident Research Laboratory were negative for carbon monoxide, cyanide, ethanol and drugs.

SURVIVAL ASPECTS

The passenger reported that following the crash, she found herself laying on the floor on her right side. Her seat belt had come undone and her seat had broken loose and was laying behind the pilot's seat. The airplane was listing to the left and the left door was open. She stood up, kicked her seat out of the open left door and crawled out of the airplane. She noticed fuel dripping from the engine, but there was no fire. The passenger stated that her injuries included a compression fracture of the L1 vertebra, a cut on her throat, multiple bruises on her right side and a bruised sternum. She attributed the cut on her throat to contact with the GPS unit which was in a holder attached to the right control yoke and commented that this injury could have been fatal if it had occurred 1/2 inch to the right and cut the carotid artery. The passenger recommended that placement of items such as a GPS unit on the control yoke should be reviewed.

The passenger reported that the pilot survived the impact, but was unconscious, trapped in his seat, and died about 10 to 12 hours after the crash. She further reported that his seat belt and shoulder harness remained fastened after the accident and she cut them while attempting to extricate him. The passenger stated that the use of crash helmets should be considered as the pilot was uninjured except for his head injury.

No ELT signal was received from the airplane. Aircraft salvage personnel found the ELT in the "OFF" position at the accident site. (On this unit, the "OFF" position is the armed position.) The ELT installation instructions contained the following information: "To test the automatic feature of the EBC-102A, with the switch in the off position, bang the EBC-102A against your hand, using medium exertion so that the pendulum activates the switch. Return the switch to the off position. Place it in the mounting bracket. The EBC-102A is now ready to activate either manually or automatically depending on the seriousness of the accident." During examination of the wreckage, the NTSB IIC tested the ELT in accordance with the manufacturer's instructions and the ELT activated (switch was moved to the "ON" position and unit began transmitting a signal). The ELT was sent to the manufacturer for further testing. When asked by the NTSB IIC about the ELT, the passenger stated that she "never knew it was there" and

"never saw it."

The passenger stated that there was a survival kit in the airplane, which she was aware of and made use of during the three days she spent waiting for rescue.

TESTS AND RESEARCH

The ELT was tested at the facilities of Emergency Beacon Corporation, New Rochelle, New York, on August 20, 2007, under the supervision of an FAA inspector. The ELT was found to be in "good operating condition" with the exception of an inoperative test lamp. The test lamp is for use during maintenance and does not affect the performance of the ELT.

Pilot Information

Certificate:	Private	**Age:**	55,Male
Airplane Rating(s):	Single-engine land	**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 With waivers/limitations	**Last FAA Medical Exam:**	November 1, 2006
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	December 1, 2005
Flight Time:	1000 hours (Total, all aircraft), 760 hours (Total, this make and model), 16 hours (Last 90 days, all aircraft), 12 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N6233E
Model/Series:	172	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	46333
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 1, 2006 Annual	**Certified Max Gross Wt.:**	2200 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	4996 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	O-300-A
Registered Owner:	On file	**Rated Power:**	145 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	MYL,5024 ft msl	**Distance from Accident Site:**	26 Nautical Miles
Observation Time:	08:50 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.07 inches Hg	**Temperature/Dew Point:**	12°C / 6°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Yellow Pine, ID (3U2)	**Type of Flight Plan Filed:**	None
Destination:	Big Creek, ID (U60)	**Type of Clearance:**	None
Departure Time:	08:15 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	45.045833,-115.456665

Administrative Information

Investigator In Charge (IIC):	Struhsaker, Georgia
Additional Participating Persons:	Lew Sanders; Federal Aviation Administration; Boise, ID Tom Teplick; Cessna Aircraft Company; Wichita, KS
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