Aviation Investigation Final Report

Location:	Garden City, Utah	**Accident Number:**	SEA08FA175
Date & Time:	August 9, 2008, 09:07 Local	**Registration:**	N63217
Aircraft:	Cessna 180K	**Aircraft Damage:**	Substantial
Defining Event:	Aerodynamic stall/spin	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot had been on a cross-country trip and was stopping to attend a local festival prior to returning to his home airport. He was performing a low-level flight over his friend's house to signal that he would be landing at a nearby airport. Witnesses reported that the airplane was at 500 feet above ground level, doing banked turns in excess of 45 degrees. The airplane began to climb and then stalled, with the left wing dropping. No preimpact mechanical anomalies were identified during the postaccident examinations. The pilot was based at an airport with an elevation of 472 feet. The calculated density altitude at the accident site was 7,901 feet mean sea level. The high density altitude would have decreased the performance of the airplane and as the pilot was conducting low-altitude maneuvers, leaving little margin for error. Because the pilot primarily operated out of an airport that traditionally has low density altitude conditions, he may not have been fully aware of the performance decrease, especially while manuevering at a low altitude.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain adequate airspeed, which led to an aerodynamic stall/spin.

Findings

Aircraft	Airspeed - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Environmental issues	High density altitude - Not specified

Factual Information

History of Flight

Maneuvering-low-alt flying	Aerodynamic stall/spin (Defining event)

HISTORY OF FLIGHT

On August 9, 2008, at 0907 mountain daylight time, a Cessna 180K, N63217, impacted a beach in Garden City, Utah. The pilot, who was also the registered owner of the airplane, was operating it under the provisions of 14 Code of Federal Regulations Part 91. The commercial pilot and one passenger were killed. The airplane sustained substantial damage. Visual meteorological conditions prevailed and no flight plan was filed. The flight departed from Yellowstone Airport (WYS), West Yellowstone, Montana, and was destined for Bear Lake County Airport (1U7), Paris, Idaho.

At the time of the accident, Garden City was hosting Raspberry Days, an annual town festival.

According to a witness who was also a friend of the pilot, the pilot and passenger had recently attended a family reunion in South Carolina and were going to spend a night in Garden City before returning home. The pilot was eventually planning on returning to his home airport of Crest Airpark (S36), Kent, Washington, which has an elevation of 472 feet. The witness reported that the pilot flew near the witness's cabin, to signal that he was in the area and would need to be picked up at the Paris airport. The witness provided a written statement and indicated that the pilot flew over the beach at 500 feet above ground level. He made a pass from east to west, with approximately 15 degrees of flaps extended. He then circled back and came over west to east. He then turned slightly south and then circled to the north and started toward Paris. The airplane began to climb and then stalled, with the left wing dropping. The airplane continued to descend until it became inverted and impacted the beach vertically in a nose down attitude.

Another witness, who was employed as a first officer for an airline, indicated that he was watching the airplane circle over the beach. The airplane appeared to be doing turns and banks in excess of 45 degrees. The airplane did several turns over the beach for about 2 to 3 minutes at altitudes less than 500 feet. Then, the airplane started flying north over the water along the beach, the nose of the airplane suddenly pitched up, the left wing dipped, and the nose swung around like a "hammerhead." The airplane then, "...went into a nose-dive straight into the ground."

PERSONNEL INFORMATION

The pilot, age 45, held a commercial pilot certificate for airplane single-engine land, and a

second-class medical certificate issued June 30, 2008, with the limitation "Must have available glasses for near vision." Investigators reviewed the pilot's logbook that was located at the accident site. The logbook indicated that the pilot had logged about 616 hours total flight time, with 438 hours in make and model. The pilot had flown 81 hours over the last 90 days, 54 hours over the last 30 days, and 1 hour during the past 24 hours.

AIRCRAFT INFORMATION

The four-seat, high-wing, fixed gear airplane, serial number (SN) 18052837, was manufactured in 1977. It was powered by a Teledyne Continental Motors O-470-U 13 series 230 horsepower engine, and equipped with a McCauley C2A34C204 constant-speed propeller.

Review of the maintenance records showed that an annual inspection was completed on July 1, 2008, at a recorded tachometer time of 3,177.2 hours, airframe total time of 3,177.2 hours, and engine time since major overhaul of 1,925.7 hours. At the accident site, the tachometer read 3,219.8 hours.

Fueling records obtained from the West Yellowstone airport showed that the pilot purchased 12 gallons of fuel. The fueler reported on the form that 6 gallons were added to each tank.

At the time of the accident, the airplane's estimated weight with 40 gallons of fuel was approximately 2,544 pounds and the center of gravity (CG) moment 109 pound-inches (range between 94 and 119 pound-inches). According to the pilot operating handbook (POH), the max gross weight for the airplane is 2,800 pounds, with a total usable fuel amount of 84 gallons.

METEOROLOGICAL INFORMATION

The closest official aviation routine weather report (METAR) was at Logan- Cache Airport, Logan, Utah, located about 22 nautical miles from the accident site. At 0851 MDT the report indicated that the skies were clear, visibility was 10 miles, winds were 320 degrees at 3 knots, the temperature was 20 degrees Celsius, the dew point was 12 degrees Celsius, and the altimeter was 30.06 inches of Mercury. Local emergency response personnel indicated that the winds were calm at the time of the accident.

Using the weather conditions reported at Logan, the density altitude at the accident site was calculated to be 7,901 feet mean sea level (msl).

One of the residents in the area reported that occasionally, unusual breezes develop from the mountains that surround the area. No observations of these breezes were reported by witnesses or first responders.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest on a sandy beach about 50 feet from the shoreline of Bear Lake, on a

south-southeast heading, and at an elevation of 5,934 feet msl. The wreckage was mainly confined to the impact area, with the exception of the left main landing gear tire, which was located 304 feet north of the wreckage. The engine was partially buried in the sand and a portion of one propeller blade was visible through the sand. The cabin area sustained extensive impact damage.

All flight control surfaces remained attached to their respective structures. The left and right wings were partially connected to the fuselage structure at the wing roots. According to emergency response personnel, both occupants were wearing their restraint systems that included shoulder harnesses. The electronic locator transmitter (ELT) activated on impact and was turned off by emergency response personnel.

Flight control cables were traced from their respective surfaces to the control yokes and rudder pedals. The cables were crushed in the deformed cockpit structure but remained continuous inboard of the wing roots. The flap control lever was positioned at approximately 10 degrees flap extension. The Cessna representative measured the horizontal stabilizer trim actuator at 7.7 inches. According to the representative, this equated to 5-6 degrees nose down trim. The stall warning horn on the wing sounded when air was blown into it. Examination of the seat tracks revealed no evidence of seat slippage.

A cursory engine examination commenced on scene, and was followed by an engine disassembly after the engine was removed from the accident site. Several areas were noted to have impact damage and the engine would not rotate. The magnetos were removed from the engine and spark was visible from the ends of the leads. The spark plugs were removed from the engine and the electrodes showed normal wear signatures in accordance with the Champion AV-27 chart. The cylinders were removed from the crankcase and all cylinder bores were free of scoring and undamaged. The cylinder skirts and rocker box areas were undamaged, as well as the pistons, piston rings, and the pin and plug assembly. All cylinders and piston heads showed a normal amount of combustion deposits. Complete disassembly showed that a portion of the crankshaft flange had separated with the propeller assembly. The main bearing journals were undamaged and showed no signs of abnormal wear or lubrication distress. The connecting rods were undamaged. The camshaft was undamaged and rotated freely in the crankcase. Impact damage was found at the number four bearing support diameters and the main bearings appeared undamaged. Residual oil was found throughout the engine.

The airframe and engine examinations revealed no pre-impact mechanical malfunctions.

MEDICAL AND PATHOLOGICAL INFORMATION

The Utah State Office of the Medical Examiner, Salt Lake City, Utah, completed an autopsy on the pilot. The cause of death was reported from injuries sustained due to an airplane crash.

Forensic toxicology was performed on specimens from the pilot by the Federal Aviation

Administration Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report was negative for carbon monoxide, cyanide, volatiles, and tested drugs.

ADDITIONAL INFORMATION

According to the Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25A), "...as air density decreases (higher density altitude), airplane performance decreases." In addition, "The density of air has significant effects on the aircraft's performance because as air becomes less dense, it reduces: power because the engine takes in less air, thrust because a propeller is less efficient in thin air, and lift because the thin air exerts less force on the airfoils."

Pilot Information

Certificate:	Commercial	**Age:**	45,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	June 30, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 25, 2008
Flight Time:	616 hours (Total, all aircraft), 438 hours (Total, this make and model), 513 hours (Pilot In Command, all aircraft), 81 hours (Last 90 days, all aircraft), 54 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N63217
Model/Series:	180K	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	18052837
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	July 1, 2008 Annual	**Certified Max Gross Wt.:**	2800 lbs
Time Since Last Inspection:	43 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3177 Hrs as of last inspection	**Engine Manufacturer:**	Teledyne Continental
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-470-U
Registered Owner:	Charles McCall	**Rated Power:**	230 Horsepower
Operator:	Charles McCall	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LGU,4457 ft msl	**Distance from Accident Site:**	22 Nautical Miles
Observation Time:	08:51 Local	**Direction from Accident Site:**	64°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	320°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	20°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	W Yellowstone, MT (WYS)	**Type of Flight Plan Filed:**	None
Destination:	Paris, ID (1U7)	**Type of Clearance:**	None
Departure Time:	07:00 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	41.935554,-111.388336

Administrative Information

Investigator In Charge (IIC):	Dunks, Kristi
Additional Participating Persons:	Lyndsay Carlson; Federal Aviation Administration; Salt Lake City, UT Andrew Swick; Teledyne Continental Motors; Sacramento, CA Tom Moody; Cessna Aircraft Company; Wichita, KS Howard Plagens; National Transportation Safety Board; Gardena, CA
Original Publish Date:	July 14, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=68662