Aviation Investigation Final Report

Location:	Salisburry, North Carolina	**Accident Number:**	ERA12FA205
Date & Time:	March 2, 2012, 13:40 Local	**Registration:**	N167ZP
Aircraft:	CESSNA AIRCRAFT CO LC42-550FG	**Aircraft Damage:**	Destroyed
Defining Event:	VFR encounter with IMC	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Before the airplane departed on a continuing cross-country flight, a lineman at the airport spoke to the pilot and mentioned the marginal nature of the weather. The pilot responded that he was going to stay below 1,900 feet and that he should be fine. The lineman recalled looking at the automated weather observing system monitor, and it was reporting 1,800-foot ceilings and 10 miles visibility locally. Witnesses reported that the airplane's takeoff and departure were normal. The lineman stated that the weather at the time was visual flight rules with light rain. The airplane was not captured on radar, and the pilot was not in radio contact with air traffic control. According to witnesses near the accident site, they heard the airplane flying overhead but did not see it due to heavy fog. One witness reported that shortly after hearing the aircraft overhead, he heard a loud splash in a nearby lake and, as he turned toward the lake, he saw a large spray of water. Shortly thereafter, a large amount of debris was observed in the water. About 30 minutes elapsed between the time the airplane took off and when it impacted the lake.

The airplane was recovered from the lake and exhibited severe fragmentation, consistent with a steep, high-speed descent and impact. A postaccident examination of the airplane and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. Based on the weather conditions reported by weather-observing equipment and witnesses, the pilot encountered instrument meteorological conditions. The steep, high-speed impact is consistent with an uncontrolled descent due to the pilot's spatial disorientation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The non-instrument-rated pilot's decision to continue flight into instrument meteorological conditions, which resulted in spatial disorientation and a loss of control.

Findings

Personnel issues	Spatial disorientation - Pilot
Personnel issues	Aircraft control - Pilot
Environmental issues	Drizzle/mist - Effect on operation

Factual Information

History of Flight

Enroute-climb to cruise	VFR encounter with IMC (Defining event)
Enroute-climb to cruise	Loss of control in flight
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On March 2, 2012, about 1340 eastern standard time, a Cessna LC42-550FG, N167ZP, was destroyed following a collision with water at High Rock Lake, Salisbury, North Carolina. The private pilot and passenger were fatally injured. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations (CFR) Part 91 as a personal flight. Marginal visual flight rule (MVFR) conditions prevailed and no flight plan was filed. The flight originated from Davison County Airport (EXX), Lexington, North Carolina, about 1310.

A lineman at EXX stated that he spoke to the pilot prior to departure and the pilot informed him that his destination was Florida. The lineman said that he mentioned the weather to the pilot, and the pilot responded that he was going to stay below 1,900 feet and that he should be fine. Shortly thereafter, the lineman went over to refuel another airplane and heard the pilot announce on the Unicom frequency that he was going to depart runway 24. The lineman watched as the airplane rotated approximately 2,000 feet down the runway and climb out normally. He said that the weather at the time was visual flight rules (VFR) with very light drops of rain. The lineman recalled looking at the Automated Weather Observing System (AWOS) monitor, and it was reporting 1,800-foot ceilings and 10 miles visibility. There were no distress calls made by the pilot or transmissions that the airplane was returning to the airport.

According to the Federal Aviation Administration (FAA), the airplane was not captured on radar at the time of departure. The pilot was not in radio contact with air traffic control at the time of departure and no radio transmissions were recorded. According to witnesses, they heard the airplane flying overhead but did not see it due to heavy fog. The witnesses reported that shortly thereafter, they heard a loud splash in the lake and as they turned towards the direction of the lake, they saw a large spray of water. Shortly thereafter, they saw a large amount of debris in the lake. They believed that it was the airplane that they had just heard and they called the local sheriff's department.

PERSONNEL INFORMATION

The pilot, age 51, held a private pilot certificate, with ratings for airplane single-engine. The pilot's last FAA medical examination was issued on October 18, 2010, for a third-class medical certificate with limitations for corrective lenses. The pilot reported 271.5 flight hours on his last medical application, and 34 flight hours within the last six months of his exam. A review of

the pilot's logbook revealed a total of 290 flight hours including 174.9 hours of cross country flight time with 120.3 hours in the accident airplane. Further review revealed 136.1 flight hours in make and model, 18 flight hours in the last 12 months, and 4.3 hours in the last 90 days. The pilot first flew the accident aircraft on August 6, 2008, the day after he took delivery of the aircraft from the factory. On August 8, 2008, the pilot attended the initial factory transition course for the Cessna 350. At the time of the course completion, the pilot completed 14 hours of ground school and 6.4 hours of flight time. Further review of the logbook revealed that the pilot's last recorded simulated instrument time was on April 18, 2009, in a Cessna 182T. There were no flights recorded by the pilot between November 05, 2011 and February 26, 2012. The pilot had recorded eight instrument approaches in the accident airplane between April 18, 2009, and March 06, 2010. The approaches were all performed during flights for which the pilot logged the time as pilot in command, and no actual or simulated instrument time was recorded on the flights. No instrument approaches were recorded after March 06, 2010, and no actual instrument flight time was recorded in the pilot's logbook.

AIRCRAFT INFORMATION

The four-seat, low-wing, fixed-gear airplane, serial number 421009, was manufactured in 2008. It was powered by a Continental IO-550N, 310-horsepower engine and equipped with a Hartzell controllable-pitch propeller. A review of a copy of the last work order revealed that the last annual inspection was completed on December 20, 2011, at 133.6 hours.

The pilot requested that the airplane be refueled prior to flight. According to fuel records the lineman refueled the airplane as per the pilot's request with 25 gallons in the right tank and 20 gallons of aviation fuel in the left tank. The lineman recalled that both tanks were within a ½ inch from the base of the filler neck.

METEOROLOGICAL INFORMATION

There is no record that the pilot obtained an official preflight weather briefing. The AWOS at EXX, located approximately 9 miles north of the accident site at an elevation 733 feet, reported the following conditions surrounding the time of the accident. At the time of departure, the weather observation was: winds calm, visibility 10 statute miles and drizzle, scattered clouds at 1,500 feet, temperature 11 degrees Centigrade (C), dew point 06 degrees C, altimeter 29.98 inches of mercury.

The National Weather Service weather depiction chart for 1100 EST depicted a large area of MVFR conditions over the Carolina's with an area of instrument flight rules (IFR) conditions over southeast section of North Carolina. The next chart at 1400 EST depicted the warm front with a larger area of MVFR conditions over the northern portions of South Carolina, all of North Carolina and south and central Virginia and West Virginia. The area of IFR conditions had expanded over a large portion of the mountains and piedmont section into the southeast coastal plains of North Carolina immediately south of the accident site. The chart indicated

VFR flight would not have been recommended over the region with deteriorating conditions with time.

The next closest weather reporting was from Rowan County Airport (RUQ), Salisbury, North Carolina, located approximately 8 miles west of the accident site at an elevation of 772 feet. The airport had an AWOS that reported the following 5 minutes before the accident: winds calm, visibility 10 statute miles, overcast clouds at 1,200 feet, altimeter 29.88 inches of mercury.

Concord Regional Airport (JQF), located in Concord, North Carolina, approximately 25 miles southwest of the accident site reported the following conditions surrounding the period: At 1355, winds calm, visibility 5 statute miles and mist, overcast clouds at 600 feet, temperature 11 degrees C, dew point 09 degrees C, altimeter 29.89 inches of mercury.

Piedmont Triad International Airport (GSO), Greensboro, North Carolina, was located approximately 32 miles northeast of the accident site at an elevation of 926 feet. The airport had an Automated Surface Observing System (ASOS) and reported the following conditions: At 1354, winds 010 at 3 knots, visibility 2 statute miles with rain and mist, overcast clouds at 1,800 feet, altimeter 29.87 inches of mercury. The surface visibility was 2.5 statute miles and rain.

The surrounding observations indicated that MVFR conditions prevailed with surface wind from the east at 7 knot or less, visibility 7 to 10 miles in possible light drizzle, ceiling broken to overcast at 1,200 to 1,500 feet agl, with a temperature-dew point spread of 3 degrees C or less. Instrument flight rules (IFR) conditions were reported within 25 miles of the accident site. The forecast for the North Carolina Piedmont region was for occasional visibility 3 to 5 miles in mist with broken clouds at 1,500 feet with tops layered to 24,000 feet, with widely scattered rain showers and isolated thunderstorms, possibly severe.

WRECKAGE AND IMPACT INFORMATION

The accident site was located in a lake, about 9 nautical miles south of EXX. The wreckage exhibited severe fragmentation and was submerged in water that was estimated to be about 27 feet deep. Sections of the wreckage recovered included fragments of the flight control surfaces and the empennage. Sections of the left and right wings, fuselage, main landing gear assembly, engine and instrument panel were also recovered. The cockpit and sections of the center fuselage around the center wing spar were recovered in fragments. Various control tubes were recovered, and they were bent and broken.

Examination of the cockpit and cabin section of the airplane revealed it was fragmented. The firewall was separated from the main fuselage. The instrument panel and instruments were crushed, and none of the aircraft instrumentation exhibited any reliable information. The flight controls were impact damaged. The fuel selector handle was observed in the right tank position. The nose landing gear wheel was attached to the gear fork.

Examination of the left wing revealed that only fragmented pieces remained. Pieces of the upper aileron skin surface were recovered, and the flap was not recovered. One of the two aileron control tubes was recovered. The left main landing gear wheel was separated from the axle and the strut was not recovered.

The vertical stabilizer was still attached to the empennage and was separated from the main fuselage. The rudder upper attachment hinge was broken away from the rudder. The center attachment hinge was still connected to the rudder. The lower attachment bolt and bearing was still connected. Rudder control cables were still attached to the rudder horn and the cables were separated from the rudder pedal control tubes.

The horizontal tubes were attached to the vertical stabilizer at the attachment holes and the left and right horizontal stabilizers were separated from the tubes and fragmented. Both left and right elevators were recovered at the hinge attached point but were separated from the horizontal stabilizers and fragmented. Three of the six elevator control rod assemblies were recovered.

Examination of the right wing revealed that it was separated from the fuselage and the outboard 10 feet of the wing as split along the tailing edge. The remaining 6 feet of the right wing was fragmented. The aileron remained attached to the wing. The aileron control tubes were not recovered. The flap was fragmented into two large sections. The right wing spar was intact along its length to the wing root. The fuel cap was secure and the fuel tank was ruptured. The right main landing gear wheel was separated from the axle and the axle remained with the wheel. The right main landing gear strut was not recovered.

Examination of the engine revealed that the engine was separated from the airframe and two of the four engine mount legs were fractured. The engine exhibited varying degrees of impact damage and debris from being submerged in a lake. Parts of the induction system, fuel system and ignition system were missing. The oil sump was crushed upward and aft against the engine crankcase. The propeller was not attached to the engine. The propeller hub studs remained in the engine crankshaft flange and the threads were stripped. The top of the engine crankcase was fractured near the crankshaft nose seal, where a bracket had been installed. The right and left magneto were not recovered. The ignition harness exhibited impact damage and only portions of the harness were recovered. The spark plugs exhibited rust, water, and mud. The electrodes exhibited normal wear when compared to the Champion Check- A-Plug chart.

The fuel pump remained attached to the engine and the fuel inlet fitting was fractured. The drive
coupling was intact and the pump turned freely by hand. The mixture control lever rotated freely from stop to stop. The fuel pump had been breached from impact damage. A small amount of water was observed draining from the pump when it was removed from the engine. The fuel pump was disassembled and no anomalies were noted. The fuel manifold valve was

not recovered.

The throttle body metering unit was not recovered. The oil pump did not show signs of signatures with hard particle passage or debris. The oil pump housing and gears had a residue consistent with oil and the oil sump was breached.

The number six cylinder exhibited impact damage and the cylinder head was partially separated from the barrel. The number six cylinder exhaust rocker arm was fractured. The cylinders were inspected using a lighted bore scope. The internal combustion chambers exhibited a material consistent with that of combustion deposits, water, mud and rust. The cylinder bores were clear of scoring and no evidence of hard particle passage was observed in the cylinder bore ring travel area. Thumb compression and valve movement was obtained on all cylinders, except number six when the crankshaft was rotated by hand via the propeller flange. The number six cylinder push rods and tubes exhibited impact damage. At the conclusion of the engine examination no anomalies were noted that would have precluded normal operation.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot on March 5, 2012, by the Office of the Chief Medical Examiner, Chapel Hill, North Carolina, as authorized by the Rowan County Coroner.

Forensic toxicology was performed on specimens from the pilot by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report stated no ethanol was detected in the liver or the muscle, and blood.

TESTING AND RESEARCH

The airplane was equipped with a Garmin G1000 integrated flight instrument system. The unit was destroyed but the one of the data cards were retrieved and forwarded to the NTSB Recorders Laboratory, Washington, DC, for further examination. Data retrieval from the data cards did not reveal any pertinent investigative information.

ADDITIONAL INFORMATION

FAA AC Advisory Circular (AC) 60-4A, “Pilot’s Spatial Disorientation,” states, in part: “The attitude of an aircraft is generally determined by reference to the natural horizon or other visual references with the surface. If neither horizon nor surface references exist, the attitude of an aircraft must be determined by artificial means from the flight instruments. Sight, supported by other senses, allows the pilot to maintain orientation. However, during periods of low visibility, the supporting senses sometimes conflict with what is seen. When this happens, a pilot is particularly vulnerable to disorientation. The degree of disorientation may vary considerably with individual pilots. Spatial disorientation to a pilot means simply the inability to tell which way is ‘up.’” The AC notes that a disoriented pilot may place an aircraft in a dangerous attitude.

The AC recommends that pilots obtain training and maintain proficiency in aircraft control by reference to instruments and to “not attempt [VFR] flight when there is a possibility of getting trapped in deteriorating weather.”

Pilot Information

Certificate:	Private	**Age:**	51,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 Without waivers/limitations	**Last FAA Medical Exam:**	March 2, 2012
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	February 26, 2012
Flight Time:	290 hours (Total, all aircraft), 136 hours (Total, this make and model), 4 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA AIRCRAFT CO	**Registration:**	N167ZP
Model/Series:	LC42-550FG	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	421009
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	December 20, 2011 Annual	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	134 Hrs as of last inspection	**Engine Manufacturer:**	Continental Motors
ELT:	C91 installed, not activated	**Engine Model/Series:**	IO-550
Registered Owner:	BOWN STEVEN M	**Rated Power:**	310 Horsepower
Operator:	BOWN STEVEN M	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	EXX,733 ft msl	**Distance from Accident Site:**	9 Nautical Miles
Observation Time:	13:15 Local	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Scattered / 1500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Unknown	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.87 inches Hg	**Temperature/Dew Point:**	11°C / 6°C
Precipitation and Obscuration:	In the vicinity - Showers - Drizzle		
Departure Point:	Lexington, NC (EXX)	**Type of Flight Plan Filed:**	None
Destination:	Venice, FL (VNC)	**Type of Clearance:**	None
Departure Time:	13:10 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	35.636943,-80.290832

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric
Additional Participating Persons:	Rene Gonzales; FAA/FSDO; Charlotte, NC Henry Soderlund; Cessna Aircraft Company; Wichita, KS Chris Lang; Continental Motors; Mobile, AL
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Last Revision Date:	
Investigation Class:	Class
Note:	
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