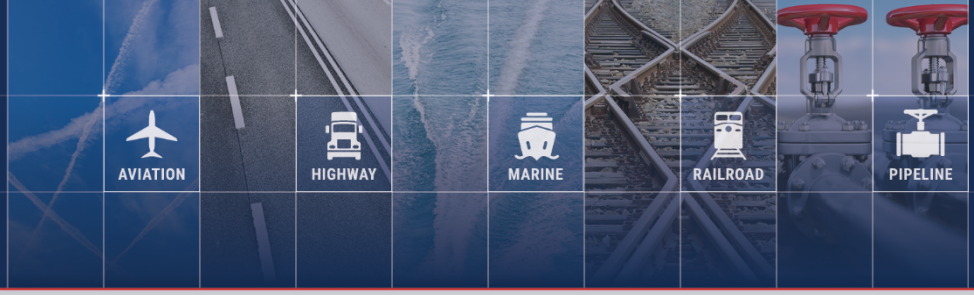

Aviation Investigation Final Report

Location:	Moncks Corner, South Carolina	**Accident Number:**	ERA12FA051
Date & Time:	October 13, 2011, 19:11 Local	**Registration:**	N3086X
Aircraft:	Cessna 150F	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

According to a flight instructor, the pilot's intent was to practice for an upcoming flight review. There were no witnesses to the accident; however, a witness at the airport observed the pilot park his car near the hangar that housed the airplane, untie the airplane, and pull it out of the hangar. Then, as the witness was leaving the airport, he saw the pilot get into the airplane. The witness also noted that the sun had gone down, but it was not quite dark when he left. Radar data for the timeframe just after the witness observed the pilot indicated a target transmitting a 1200 transponder code that is consistent with the airplane's location. Just after sunset, the airplane took off and, after a brief flight to the northwest of the airport, entered the airport traffic area and completed a landing. After 5 minutes, the airplane was again airborne, and, according to radar data, completed another landing or a low approach. There was no further radar contact.

The pilot was reported missing 11 days after the accident and was found 3 days after that about 30 feet away from the airplane wreckage. The wreckage came to rest wedged between several trees about half way along, and to the right of, the runway about 60 feet outside the northwest airport perimeter fence. Initial tree cuts were consistent with an approximate 45-degree right-wing-down turn and 45-degree angle of descent, which is consistent with the pilot's loss of control in flight. An examination of the wreckage revealed no mechanical malfunctions or failures that would have precluded normal operation.

The pilot's location at the accident site indicated that he was able to unhook his seatbelt and extricate himself from the airplane. Autopsy results for the pilot indicated that the cause of death was most likely the "toxic effects of ethylene glycol," a substance most frequently

encountered in antifreeze fluid. Toxicological testing did not reveal the presence of ethylene glycol, but the autopsy found associated crystals in the kidney, indicating that the pilot survived long enough for the substance to clear his system. Initial symptoms of ethylene glycol poisoning mimic acute ethanol intoxication, with slurred speech and ataxia. Depression of the central nervous system can result in coma. Kidney failure is a late stage symptom.

According to the pilot's logbooks, his most recent flight review was about 9 years before the accident, and his most recent recorded flight was about 5 months before the accident. It was unknown if the pilot had recently flown but not logged the flight time. Although the pilot's lack of recently logged flight time could indicate a loss of airplane control related to a lack of currency, it is far more likely that the debilitating effects of ethylene glycol posioning rendered him unable to control the airplane while airborne. How or why the pilot may have ingested ethylene glycol is beyond the scope of this investigation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The debilitating effects of ethylene glycol poisoning, which resulted in the pilot's inability to maintain control of the airplane.

Findings

Aircraft	(general) - Not attained/maintained
Personnel issues	(general) - Pilot

Factual Information

History of Flight

Prior to flight	Unknown or undetermined
Initial climb	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On October 13, 2011, at 1911 eastern daylight time, a Cessna 150F, N3086X, was substantially damaged when it impacted trees and terrain at Berkeley County Airport (MKS), Moncks Corner, South Carolina. The private pilot was fatally injured. Twilight visual meteorological conditions prevailed. No flight plan had been filed for the personal flight, which was conducted under the provisions of 14 Code of Federal Regulations Part 91.

According to a flight instructor, the pilot’s intent was to practice for an upcoming flight review.

There were no witnesses to the accident; however, there was a witness to the pilot's activities prior to starting the airplane. That witness stated that he saw the pilot park his car near the hangar that housed the airplane, untie it, and pull it out of the hangar. Then, as the witness was leaving the airport, he saw the pilot get into the airplane. The witness also noted that the sun had gone down, but it was not quite dark when he left.

Radar, just after the timeframe that the witness had seen the pilot, included a target transmitting a 1200 transponder code. At 1851, the target was first observed at 100 feet, departing runway 23. The target then made a left turn, followed by a right turn, and proceeded to the northwest. It subsequently completed a turn back toward the airport and entered a left downwind leg at 800 feet. After the left downwind, the target completed a left descending turn to a final approach to runway 23, with the final radar contact of the approach occurring at 1902.

At 1907, another target was observed at 100 feet, departing runway 23. The target entered a left downwind and subsequently completed the traffic pattern, with last contact approaching runway 23 at 1911. There was no further radar contact.

The pilot was reported missing on October 24, 2011, and he and the airplane were found on October 27, 2011.

PERSONNEL INFORMATION

According to Federal Aviation Administration (FAA) records, the pilot, age 64, held a private

pilot certificate with an airplane single-engine land rating. His most recent FAA third class medical certificate was issued April 15, 2011, and at the time, the pilot reported 1,060 total hours of flight experience. According to the pilot's logbooks, his most recent flight review occurred on June 15, 2002, and his most recent recorded flight occurred on May 8, 2011, at 1,062.6 hours of flight time.

AIRCRAFT INFORMATION

According to FAA records, the airplane was manufactured in 1966 and registered to the owner on August 10, 1992. It was powered by a Continental Motors O-200 series, 100-horsepower engine. The airplane's most recent annual inspection was completed on July 10, 2011. At the time of the inspection, the reported total time was 3,600.2 hours in service with a tachometer time of 1,688.0 hours.

METEOROLOGICAL INFORMATION

Weather, recorded at the airport at 1855, included calm wind, visibility 10 statute miles, clear skies, temperature 22 degrees C, dew point 18 degrees C, and an altimeter setting of 29.65 inches Hg.

According to United States Naval Observatory data, sunset occurred at 1849. The end of civil twilight occurred at 1914, and moonrise was not until 1933, with the moon then having a 98 percent visible disk.

AIRPORT INFORMATION

Runway 23 was 4,351 feet long and 75 feet wide, and was constructed of concrete. The airport did not have an air traffic control tower. Communications utilized a common traffic advisory frequency and were not recorded.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located in a level, wooded area about 60 feet outside the northwest airport perimeter fence, about 1,900 feet from the approach end of runway 23. The airplane came to rest in the vicinity of 33 degrees 11.24 minutes north latitude, 080 degrees 02.25 minutes west longitude. Initial tree cuts were consistent with an approximately 45-degree right-wing-down turn, 45-degree angle of descent, on a 330-degree magnetic heading.

The airplane came to rest wedged between several trees, with the wings, left wing up, right wing down, nearly vertical. About 8 feet from the right wing tip, where the wing was first in contact with the ground, it was bent about 90 degrees toward, and under the fuselage. The fuselage came to rest approximately parallel to, and about 5 feet above the ground.

All components of the airplane were located at the accident site, and flight control continuity

was confirmed to all flight control surfaces. The flaps were confirmed extended to about 15 degrees by measurement of the flap actuator drive screw.

The tachometer time was 1,688.9 hours.

The engine firewall was deflected upward. The fuselage and empennage remained intact and were wrinkled and dented. Both wings exhibited leading edge, aft crushing. The elevator, horizontal stabilizer, rudder, and vertical stabilizer remained attached at all attachment points. The vertical stabilizer exhibited leading edge impact damage while the leading edges of the horizontal stabilizers were not damaged.

The propeller remained attached to the propeller hub. One blade was missing the propeller tip, and exhibited s-bending and leading edge damage. The other blade exhibited slight aft bending.

The engine remained attached to the fuselage. Crankshaft continuity was confirmed to the accessory section of the engine by hand-turning the propeller. Compression was obtained on three of the four cylinders with the fourth cylinder exhibiting impact damage. Spark was obtained on all towers of the magnetos. The presence of fuel was confirmed in the right fuel tank, fuel lines, and carburetor.

The field examination of the airframe and powerplant revealed no preimpact mechanical anomalies that would have precluded normal airplane operation.

MEDICAL AND PATHOLOGICAL INFORMATION

According to local authorities, the pilot was found about 30 feet from the airplane.

An autopsy was performed on the pilot at the Medical University of South Carolina, Charleston, South Carolina, with the cause of death reported as "probable toxic effects of ethylene glycol."

The autopsy also noted that there were scattered contusions and abrasions on the body up to 1 inch [in length], fractures of the 6th and 7th ribs, and hemorrhagic abdominal wall musculature, but no palpable fractures or dislocations of the extremities.

Microscopic examination of the kidney revealed the presence of numerous fan-shaped, birefringent crystals.

According to the toxicological profile for ethylene glycol prepared by the United States Department of Health and Human Services:

“Information on the health effects of oral exposure in humans is largely limited to case reports of acute accidental or intentional ingestion of ethylene glycol. These case reports have identified three stages of acute oral ethylene glycol toxicity in humans. These stages are well

documented and occur within 72 hours after ingestion. The first stage involves central nervous system depression, metabolic changes (hyperosmolality), and gastrointestinal upset, and spans the period from 30 minutes to 12 hours. During the second stage (12–24 hours after ingestion), metabolic acidosis and associated cardio-pulmonary symptoms…become evident. During stage three, which covers the period 24–72 hours after ethylene glycol ingestion, renal involvement becomes evident. The third stage is characterized by flank pain and oliguria/anuria. Histopathological findings show renal tubular necrosis and deposition of calcium oxalate crystals. Often, the cardiopulmonary effects in the second stage are not evident, so the distinguishing symptoms of ethylene glycol intoxication are central nervous system depression, acidosis, and nephrotoxicity."

The profile also noted that, "Adverse neurological reactions are among the first symptoms to appear in humans after ethylene glycol ingestion."

Forensic toxicology testing was also performed at the FAA Bioaeronautical Sciences Research Laboratory, in Oklahoma City, Oklahoma. The results included no carbon monoxide or cyanide detected in the blood, no ethanol detected in the urine, Bupropion detected in the urine but not in the blood, and 1.187 (ug/mL, ug/g) Lamotrigine detected in the blood and urine. Ethylene glycol was not noted.

Neither Bupropion nor Lamotrigine were reported on the pilot's most recent application for a medical certificate, and the investigation was unable to identify treating physicians or obtain further personal medical information.

According to the NTSB Medical Officer Factual Report, "buproprion is an antidepressant used to treat depression and as a smoking cessation aid. Buproprion carries the following FDA warnings: 1) a dose-dependent risk of seizures; 2) may impair mental and/or physical ability required for the performance of potentially hazardous tasks (e.g., driving, operating heavy machinery). Lamotrigine is an atypical anti-seizure medication that is also used to treat bipolar disease."

An investigation into how or why the pilot may have ingested ethylene glycol is beyond the scope of this investigation.

Pilot Information

Certificate:	Private	**Age:**	64,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:**	April 15, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	June 15, 2002
Flight Time:	1062 hours (Total, all aircraft), 902 hours (Pilot In Command, all aircraft), 0 hours (Last 90 days, all aircraft), 0 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N3086X
Model/Series:	150F	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Utility	**Serial Number:**	15064486
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	July 10, 2011 Annual	**Certified Max Gross Wt.:**	1600 lbs
Time Since Last Inspection:	1 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1689 Hrs at time of accident	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, not activated	**Engine Model/Series:**	O-200 SERIES
Registered Owner:	TOLLETT KENNETH W	**Rated Power:**	100 Horsepower
Operator:	TOLLETT KENNETH W	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	MKS,73 ft msl	**Distance from Accident Site:**	
Observation Time:	18:55 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	Unknown	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.64 inches Hg	**Temperature/Dew Point:**	22°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Moncks Corner, SC (MKS)	**Type of Flight Plan Filed:**	None
Destination:	Moncks Corner, SC (MKS)	**Type of Clearance:**	None
Departure Time:	19:07 Local	**Type of Airspace:**	

Airport Information

Airport:	Berkeley County Airport MKS	**Runway Surface Type:**	Concrete
Airport Elevation:	80 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	23	**IFR Approach:**	None
Runway Length/Width:	4351 ft / 75 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	33.187221,-80.037498

Administrative Information

Investigator In Charge (IIC):	Cox, Paul
Additional Participating Persons:	Todd Clamp; FAA/FSDO; Columbia, SC Peter Basile; Cessna Aircraft Company; Witchita, KS
Original Publish Date:	October 29, 2013
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=82187