



Aviation Investigation Final Report

Location:	Maryland Heights, Missouri	Accident Number:	CEN13FA030
Date & Time:	October 24, 2012, 20:40 Local	Registration:	N55620
Aircraft:	Piper PA-28-140	Aircraft Damage:	Substantial
Defining Event:	Fuel related	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

As the airplane was approaching the destination airport for a night landing, a witness saw the airplane maneuvering as it passed overhead. She also remarked that the engine sounded like it was sputtering and thought that the pilot was attempting to land the airplane on the beach of a nearby lake. The airplane impacted the water and cartwheeled before sinking. A test run of the engine was conducted; the engine started and ran at various power settings. An examination of the airplane and engine revealed no preimpact anomalies that would have precluded normal operation. The temperature and dew point about the time of the accident indicated that the airplane was operating in conditions that were conducive to serious icing at glide power. The pilot was in an extended descent and most likely had the power on the engine reduced for the descent. Although the carburetor heat was found on it is unknown when the pilot activated the carburetor heat. The engine controls were in positions consistent with an attempt to restart the engine; it is likely that the loss of engine power was due to carburetor ice and that the carburetor heat was not activated until after the engine began to lose power.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to activate the carburetor heat while operating in conditions conducive to carburetor icing, which resulted in a loss of engine power due to carburetor ice.

Findings

Environmental issues

Conducive to carburetor icing - Effect on equipment

Factual Information

History of Flight

Approach	Loss of engine power (partial)
Approach	Fuel related (Defining event)
Emergency descent	Off-field or emergency landing

HISTORY OF FLIGHT

On October 24, 2012, about 2040 central daylight time, a Piper PA-28-140, N55620, was substantially damaged when it impacted Creve Coeur Lake, near Maryland Heights, Missouri. The airline transport certificated pilot and passenger were fatally injured. The airplane was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Night visual meteorological conditions prevailed for the flight, which operated on a visual flight rules flight plan. The flight originated from Delaware, Ohio, and was en route to Creve Coeur Airport (K1H0), St. Louis, Missouri.

According to a Federal Aviation Administration (FAA) inspector, the flight had departed Factoryville, Pennsylvania, the day of the accident and stopped in Delaware, Ohio, for fuel.

At 1952, the pilot contacted the St. Louis Lambert terminal radar approach control facility and reported his altitude as 4,500 feet. At 2007, the pilot requested clearance through class bravo (B) airspace, en route to Creve Coeur airport. The controller provided a clearance via the Cardinal VOR and was ultimately cleared to descend to and then below 2,200 feet. The pilot acknowledged these clearances. At 2037, the pilot was cleared to change to the advisory frequency for the Creve Coeur airport and acknowledged that transmission. No other communications were recorded between air traffic control and the pilot.

A witness located on the northeast side of the lake reported that she heard the airplane fly overhead and stated that it sounded low. The airplane approached her position from the east. She stated that the airplane turned to the south and then back to the east as it passed overhead. She also remarked that the engine sounded like it was sputtering. She thought that the pilot was attempting to land the airplane on the beach of Creve Coeur Lake. She then saw the airplane impact the water and cartwheel before sinking.

First responders reported that the airplane was submerged in five feet of water and came to rest inverted.

PERSONNEL INFORMATION

The pilot, age 78, held an airline transport pilot certificate with a multiengine land rating and 14

different type ratings. In addition, the pilot held a commercial pilot certificate with single engine land and sea ratings and five different type ratings. He was issued a third class airman medical certificate on July 13, 2011. The certificate contained the limitation "must wear corrective lenses. Not valid for any class after July 31, 2013."

The pilot's personal flight logbook was not located. According to his last airman medical certificate application dated July 13, 2011, he had logged no less than 27,000 hours flight time, five of which had been logged in the previous six months.

AIRCRAFT INFORMATION

The accident airplane, a Piper PA28-140 (serial number 28-7325445), was manufactured in 1973. It was registered with the FAA on a standard airworthiness certificate for normal operations. A Lycoming O-320-E3D engine rated at 150 horsepower at 2,700 rpm powered the airplane. The engine was equipped with a fixed pitch, two-blade metal propeller.

The airplane was maintained under an annual inspection program. A review of the maintenance records indicated that an annual inspection had been completed on October 19, 2012, at an airframe total time of 2,481.5 hours. The airplane had flown approximately 9.3 hours between the last inspection and the accident and had a total airframe time of 2,490.78 hours.

METEOROLOGICAL INFORMATION

The closest official weather observation station was at Lambert-St. Louis International Airport (KSTL), St. Louis, Missouri, located 7 nautical miles (nm) east of the accident site. The elevation of the weather observation station was 618 feet mean sea level. The routine aviation weather report (METAR) for KSTL, issued at 2051, reported, wind from 160 degrees at 8 knots, visibility 10 miles, sky condition broken 2,500 feet, temperature 24 degrees Celsius (C), dew point temperature 16 degrees C, and altimeter 29.89 inches.

According to the United States Naval Observatory, Astronomical Applications Department Sun and Moon Data, the sunset was recorded at 1810 and the end of civil twilight was 1837. The Moon rose at 1523, and set at 0320 on the following day. The Moon was waxing gibbous with 76% of the Moon's visible disk illuminated.

A review of the carburetor icing probability chart, located in the FAA's Special Airworthiness Information Bulletin CE-09-35, dated 6/30/2009, revealed that the airplane was operating in conditions favorable for the formation of "serious icing at glide power."

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest inverted in Creve Coeur Lake in approximately 5 feet of water, at an elevation of 470 feet. The nose of the airplane was oriented on an approximate heading of

south. The main wreckage included the left and right wings, empennage, fuselage, and engine and propeller assembly.

Rescue crews hooked on to the empennage of the airplane and pulled it towards shore in order to aid in recovery of the victims. The damage to the empennage was a result of recovery and not a result of the accident sequence.

The fuselage included two front seats, the instrument panel, forward and two side windscreens, and the main cabin door. The main cabin door remained attached to the fuselage and had been bent during the recovery process. The right forward seat was forward in the seat track, the seatbelt was unlatched, and shoulder harness had been cut during the rescue process. The left forward seat was aft in the seat track and the seatbelt and shoulder harness were unlatched. The fuselage was otherwise unremarkable.

The following engine and airplane control positions were recorded:

Throttle – Full forward

Mixture – Full rich

Carburetor Heat – On

Fuel Selector Valve – Right Tank

The engine and propeller assembly remained attached to the fuselage. The cowling was bent. Dirt, rocks, and vegetation were impacted between the propeller spinner and the propeller flange. Both propeller blades remained attached to the engine and were covered with dirt and rocks. Approximately 2 tablespoons of water were drained from the gascolator on the engine. The engine oil measured over 8 quarts on the engine oil dipstick and was consistent in texture and color with recently changed oil. The propeller and engine were otherwise unremarkable.

The right wing included the right aileron, right flap, and right landing gear assembly. The right flap was extended to the second “notch.” The right aileron flight control cables remained attached and were continuous and correct from the right aileron inboard to both flight control yokes in the cabin. The wing and wheel pant were otherwise unremarkable. Two gallons of water were drained from the right wing fuel tank. A thin film ¼ inch deep, of a blue liquid, consistent in smell and color with aviation fuel, layered on top of the two gallons of water.

The left wing included the left aileron, left flap, and left landing gear assembly. The left flap was extended to the second “notch.” The left aileron flight control cables remained attached and were continuous and correct from the left aileron inboard to both flight control yokes in the cabin. Approximately 90 inches of the outboard, leading edge of the left wing was crushed down, aft, and twisted. The inboard portion of the left wing was unremarkable. The forward portion of the left landing gear wheel pant was broken. Two and a half gallons of water were drained from the left wing fuel tank. A thin film of a blue liquid, ¼ inch deep, consistent in smell and color with aviation fuel, was layered on top of the two and a half gallons of water.

The empennage was bent and twisted; however, the damage was incurred during the recovery

of the airplane from the water. Prior to recovery the empennage was unremarkable. The flight control cables for the rudder and stabilator were continuous and correct from the respective flight control forward to the flight control yokes and rudder pedals in the cabin of the airplane. No preimpact anomalies were found with the airframe.

MEDICAL AND PATHOLOGICAL INFORMATION

The autopsy was performed by the Saint Louis County Health – Office of the Medical Examiner, on October 25, 2012. The autopsy on the pilot concluded that the cause of death was anoxic brain injury due to drowning.

The FAA's Civil Aerospace Medical Institute, Oklahoma City, Oklahoma, performed toxicological tests on specimens that were collected during the autopsy (CAMI Reference #201200240001). Results were negative for all carbon monoxide, cyanide, and volatiles. Testing of the blood and muscle revealed atropine. Atropine is an acetylcholine muscarinic receptor antagonist often used in emergency resuscitation efforts.

TESTS AND RESEARCH

The airplane was recovered to a secure facility near Wright City, Missouri, for further examination of the engine.

The upper and lower banks of sparkplugs were removed from all four cylinders. The sparkplugs were wet with water and several were white in color consistent with a lean fuel situation. The oil sump was drained revealing both water and oil. The fuel gascolator was removed and was full of water. The screen was free of debris. The filter on the electric fuel pump was free of contamination and blockage and odor from the fluid inside the fuel pump smelled consistent with fuel. Water was drained from the cylinders and throughout the exhaust system. Borescope examination of the cylinders revealed signs of normal operation. Both magnetos were removed, placed on a test bench, and functionally tested. Once the magnetos were dry, they produced a blue spark across each lead.

The engine and airframe were tied to a trailer for the testing purposes. The magnetos were reinstalled, the engine was timed, and attached to an external fuel and power source. The engine started without hesitation and ran at varying power settings for 10 minutes. A maximum level of 1,900 rpm was reached. The engine throttle was not advanced to full rpm position because of the potential for unseen damage to the propeller and propeller flange. No preimpact anomalies were found with the engine.

Pilot Information

Certificate:	Airline transport; Commercial; Private	Age:	78
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Glider	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	July 13, 2011
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	27000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N55620
Model/Series:	PA-28-140	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:		Serial Number:	28-7325445
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	October 19, 2012 Annual	Certified Max Gross Wt.:	
Time Since Last Inspection:	9 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	2491 Hrs at time of accident	Engine Manufacturer:	LYCOMING
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	O-320 SERIES
Registered Owner:	On file	Rated Power:	150 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night
Observation Facility, Elevation:	KSTL,618 ft msl	Distance from Accident Site:	7 Nautical Miles
Observation Time:	20:51 Local	Direction from Accident Site:	90°
Lowest Cloud Condition:	25000 ft AGL	Visibility	10 miles
Lowest Ceiling:	Broken / 25000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	160°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.88 inches Hg	Temperature/Dew Point:	24°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Delware, OH	Type of Flight Plan Filed:	VFR
Destination:	Maryland Heights, MO	Type of Clearance:	None
Departure Time:		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:	38.773612,-90.492774

Administrative Information

Investigator In Charge (IIC):	Rodi, Jennifer
Additional Participating Persons:	Larry Sadowski; FAA Flight Standards District Office; St. Ann, MO Rick McGuire; FAA Flight Standards District Office; St. Ann, MO Mike McClure; Piper Aircraft; Duncanville, TX Troy Helgeson; Lycoming Engines; CO
Original Publish Date:	June 19, 2013
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=85427

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).