Aviation Investigation Final Report

Location:	Venice, Florida	**Accident Number:**	ERA14LA362
Date & Time:	July 27, 2014, 14:45 Local	**Registration:**	N8826C
Aircraft:	Piper PA28	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 Fatal, 2 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was conducting a short flight from one airport to another airport to obtain fuel for the airplane. The pilot reported that the airplane had been kept in a hangar and had not been flown in the preceding 3 1/2 months. The pilot performed a preflight inspection of the airplane and noted the fuel quantity but he did not sump the fuel tanks. He subsequently performed an engine run-up and departed without incident. He climbed the airplane to about 1,000 ft and, after some maneuvering, eventually flew over the water and paralleled a shoreline toward another airport. The pilot reported that the engine then began to run roughly and that he heard a "missing, knocking, hitting sound" but that neither he nor the pilot-rated passenger noted a decrease in engine rpm. Although the pilot rotated the ignition switch through the various positions and changed fuel tanks, the engine lost power and the propeller began wind-milling.

The pilot declared an emergency and angled the descending airplane toward the shoreline. He was concerned that, if he landed in deeper water, the fixed-landing-gear airplane would flip over. The pilot saw a group of people along the beach and attempted to navigate around them. He then aimed for a spot where he thought there were no people, and the airplane touched down in the water near the shoreline and then came to rest on the sand near the water's edge. The pilot exited the airplane and learned that he had struck two people in the water.

Postaccident examination of the airframe and engine, which included a successful engine test run using fuel from the airplane's fuel system, did not reveal any evidence of water contamination or mechanical malfunctions or failures that would have precluded normal operation. Given this evidence, the loss of engine power was likely a transient condition. Although the condition could have resulted from pilot action, neither the pilot nor the passenger indicated that the pilot took any action that would have resulted in the loss of engine power. Although the airplane was operating in conditions that were conducive to the formation of carburetor ice without the carburetor heat on, the fixed-pitch propeller/engine combination did not gradually lose rpm, which would have occurred if carburetor ice had developed. Therefore, the reason for the loss of engine power could not be determined.

The National Transportation Safety Board asked the Federal Aviation Administration (FAA) to provide information on any policy that addressed protecting people on the ground during a loss of engine power. The FAA responded, in part, "Because of the variety of possible emergency situations, it is impractical to apply a specific policy addressing risks involved between beach landings and ditching. The FAA relies on its requirements for pilot training on aeronautical decision making to compel pilots to pursue courses of action in an emergency which appear to be the safest and most appropriate under the circumstances." Once the engine failed, the pilot chose to land on a shoreline area that he incorrectly believed was unoccupied.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A total loss of engine power for reasons that could not be determined because postaccident examination of the engine revealed no mechanical malfunctions or failures that would have precluded normal operation. Contributing to the accident was the pilot's failure to identify occupants on the ground near the shoreline in the airplane's forced landing path.

Findings

Not determined	(general) - Unknown/Not determined
Personnel issues	Identification/recognition - Pilot

Factual Information

History of Flight

Enroute	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Landing	Miscellaneous/other

On July 27, 2014, about 1445 eastern daylight time, a Piper PA-28-181, N8826C, was substantially damaged during a forced landing to a shoreline in Venice, Florida. The private pilot and the pilot-rated passenger were not injured; however, two people in shallow water near the shoreline were fatally injured. Visual meteorological conditions prevailed, and no flight plan had been filed for the personal flight between Buchan Airport (X36), Englewood, Florida, and Venice Municipal Airport (VNC), Venice, Florida, conducted under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91.

In an interview with the responding Federal Aviation Administration (FAA) inspector, the pilot stated that it was the first time the hangered airplane had flown in the preceding 3 1/2 months. The pilot later wrote that, after arriving at the hangar, he checked the fuel levels and noted "Right tank below tab. Left tank at tab." He also checked the oil level and added 3/4 quart of oil to the engine.

The pilot started the engine and made several magneto checks; the left magneto consistently ran "rough with 300 drop." He then shut down the engine and discussed the situation with an individual who had been working on another airplane in the hangar. The pilot subsequently started the engine again, and completed additional magneto operational checks with "all mags check[ing] out." The pilot then made a decision to go on a short flight and land at VNC for fuel, and he invited the other individual to go on the flight.

After taxiing to the run-up area, the pilot completed another engine run-up, with no anomalies noted.

The airplane subsequently took off from runway 30, with the climbout at best angle to 500 ft, and a slow turn south along the Intercoastal Waterway. The pilot subsequently climbed the airplane to 1,000 ft and cruised at 2,100 rpm. After maneuvering for a short while, the pilot headed the airplane north toward VNC with the engine rpm at 2,300 to 2,400 and the mixture remaining rich. The pilot decided to fly a 45-degree intercept to the VNC runway 23 downwind leg of the traffic pattern, passing over the beach at 900 to 1,000 ft.

En route, the engine started making a "missing, knocking, hitting sound. Rapid deterioration," according to the pilot. In a statement to county sheriff's office personnel and the FAA, the passenger recalled, that, in flight, the engine started running"…like there was a fouled plug or something…it started running rough a little bit…that was before it quit." The pilot subsequently adjusted the mixture and throttle to remove the knock, but the engine experienced a sudden total loss of power.

The pilot turned the fuel pump on and switched fuel tanks. The altitude was "dropping" and the pilot adjusted for best glide airspeed. He then looked toward VNC to land on runway 31 but decided the

airplane would not reach the runway. He called VNC Unicom and declared an emergency, responding to questions about the airplane's location and registration.

The pilot then decided to target the Casperan Beach shoreline. He observed "only sparse population on sand" and a "group of people on high ground," which required him to keep the airplane over the water to remain clear of the grouping of people and noted that he could maneuver to shore, if able. The passenger also noted that, as the airplane approached the shoreline, he did not see people in the water. He further noted that, as the airplane was descending, the pilot "kept…pulling the nose up to try to extend the glide." The airplane subsequently touched down in shallow water on a northerly heading angled slightly toward the shore and came to a quick stop.

After the pilot and the passenger got out of the airplane, a lady shouted to them that she needed a cell phone. The pilot thought she wanted to call on their behalf, and it was only then that he learned that the airplane had hit two people in the water.
Neither the pilot nor the passenger indicated that the pilot applied carburetor heat during the flight.

According to an employee at VNC, about 1445, the pilot made an announcement on the common airport frequency, "to the effect of – emergency can't make the airport." The employee called 911 and asked the pilot of another airplane to provide the location; he responded that the airplane was on the beach about 1 mile south of VNC.

County sheriff's office personnel also provided transcripts from interviews with six witnesses. Witnesses were generally consistent as to what they saw and heard. The airplane was seen heading northward, over water, but angled in toward the north-south shoreline. It initially touched down in water but came to rest mostly on sand at the water's edge.

One witness stated that he was standing in waist-deep water about 10 to 15 ft from the shore and about 150 ft south of the two people struck. He saw the airplane descend and it passed directly over his head about 30 ft above him. There was no noise from the engine and the propeller was "kinda moving." He watched the airplane descend toward a group of people. It cleared half of the group, but apparently did not clear all of them. The witness further stated that he thought the airplane was "drifting in because I was far enough out in the water that if he had continued on a straight course he probably would have just hit the water."

Several other witnesses also noted that the engine was not running and that the propeller was turning; some noted the sound of a "thump" in conjunction with the landing. One witness stated that when the airplane hit the water, it "kind of kicked over to the right," then went up onto the beach.

The airplane struck a father and daughter. According to the wife/mother of the victims, the family, consisting of herself, her husband, three children, and his mother, arrived at the beach shortly before noon. About 1 hour later, another couple joined them. The group then moved farther up the beach to avoid new beachgoers, leaving the husband's mother at the original location.

At the time of the accident, the wife was near the shoreline, with her husband and daughter about 10 to 15 ft directly behind her in about 2 ½ feet of water. The two had been bending over to use strainers to collect shark teeth from the bottom. The wife first heard the airplane then saw it out of her peripheral

vision to the left but had not seen it hit her family as it was out of her line of sight at the time. She then saw the airplane glide along the water and onto the sand. Her stepson, who was coming out of the water when the airplane passed by, told her that he had ducked when it went over his head, but did not indicate if he saw his father or his sister hit.

Pilot Information

Certificate:	Private	**Age:**	57,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	February 11, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	February 11, 2013
Flight Time:	203 hours (Total, all aircraft), 74 hours (Total, this make and model), 172 hours (Pilot In Command, all aircraft), 0 hours (Last 90 days, all aircraft)		

The pilot, age 57, held a private pilot certificate with an airplane single-engine land rating. The pilot reported 203 flight hours with 74 hours in make and model. His latest FAA third class medical certificate was obtained on February 11, 2013.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N8826C
Model/Series:	PA28 181	**Aircraft Category:**	Airplane
Year of Manufacture:	1976	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28-7690168
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	February 17, 2014 Annual	**Certified Max Gross Wt.:**	2550 lbs
Time Since Last Inspection:	10 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1902 Hrs at time of accident	**Engine Manufacturer:**	LYCOMING
ELT:	Not installed	**Engine Model/Series:**	O-360 SER
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The airplane was powered by a Lycoming O-360-series engine driving a fixed-pitch, two-blade metal

propeller. The latest annual inspection was completed on February 17, 2014, at airframe total time of 1,902 hours and engine time since overhaul of 836 hours.

There were no recording devices on the airplane.

According to the PA-28-181 Pilot's Operating Handbook (POH), the wing fuel tank capacity was 24 gallons usable. The tab mark was placarded at 17 gallons usable.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	VNC,3 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	14:55 Local	**Direction from Accident Site:**	60°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / None	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	260°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	32°C / 24°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Englewood, FL (X36)	**Type of Flight Plan Filed:**	None
Destination:	Venice, FL (VNC)	**Type of Clearance:**	None
Departure Time:	14:30 Local	**Type of Airspace:**	Class G

While exact temperature/dew point conditions could not be determined over the water where the airplane was flying, VNC recorded, at 1455, an onshore-wind temperature of 32° C (90° F) and a dew point of 24° C (75° F). Under those conditions, the carburetor icing probability chart found in FAA Special Airworthiness Information Bulletin CE-09-35 indicated a 60 percent relative humidity and a probability of carburetor ice at glide and cruise power.

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	2 Fatal	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal, 2 None	**Latitude, Longitude:**	27.067222,-82.448608(est)

On-scene photographs showed the airplane upright and nose-down at the waterline, angled slightly towards the beach with the magnetic compass indicating 350 degrees magnetic. The nose landing gear was separated from the airframe, while both fixed main landing gear remained attached. The left wing, which was extended over the water, had about 4 feet of leading edge crushing on the outboard portion of the wing, and the wingtip was undamaged. The two-blade metal propeller exhibited no damage to one blade, while the other was bent aft about 60°, beginning mid-span.

Photographs of the cockpit showed the fuel was selected off, the magnetos were off, the mixture was rich, the throttle was forward and the carburetor heat was off. The pilot indicated to the FAA inspector that he had turned off the fuel and ignition after landing. The Hobbs meter indicated about 22 minutes of operating time, consistent with the pilot's recollection of 10 to 15 minutes of flight time.

The wing fuel tanks were subsequently defueled, the wings were removed, and the airplane was transported to a storage facility. There, NTSB, FAA, Piper Aircraft, and Lycoming Engine investigators further documented the airframe and engine.

The fuel supply line from each wing fuel tank to its disconnect point in the cockpit and each fuel tank vent line was checked via air flow and found to be unobstructed. Engine compression, magneto spark, fuel quality and engine crankshaft continuity checks were also accomplished with no anomalies noted.

The fuselage with engine still attached was then strapped down to a trailer and the original onboard fuel was supplied to the fuel selector valve via a portable external tank. The engine started on the second attempt; however, with the damaged propeller, it could only safely be operated to about 900 rpm. The propeller was then removed and partially straightened to the extent of available capability, then reattached. The engine was subsequently restarted and was able to be run throughout the throttle range up to 2,000 rpm safely. Magneto checks at that rpm yielded about a 100-rpm drop for both the left and the right magneto.

After the engine run-ups, the carburetor was removed, disassembled and examined, with nothing found that would have precluded normal operation.

Additional Information

Water in Fuel

Per FAA Advisory Circular 20-125, "Water can enter an aircraft…by condensation and precipitation (especially when an aircraft has partially filled tanks)." In addition, "The greatest single danger of water in fuel results from human error that allows fuel contaminated with water to enter an aircraft fuel system or permits an aircraft to be operated before its fuel system is properly checked for water."

The pilot provided a list of items performed before, during, and after the flight. However, the list did not mention sumping the fuel during the preflight inspection. The pilot was asked by email to "confirm

preflight procedures in regards to checking fuel quality." The pilot responded with the original list and stated, in part, that the "fuel and oil quantities were verified and oil quantity was addressed." A subsequent email to the pilot specifically noted not wanting to miss any information about his sumping the fuel, but the pilot did not respond.

The passenger stated that he was not present for the preflight inspection.

Carburetor Icing

According to the POH, "Under certain moist atmospheric conditions at temperatures of -5 to 20 degrees C, it is possible for ice to form in the induction system, even in summer weather. This is due to the high air velocity through the carburetor venture and the absorption of heat from this air by vaporization of the fuel. To avoid this, carburetor preheat is provided to replace the heat lost by vaporization. Carburetor heat should be full on when carburetor ice is encountered. Adjust mixture for maximum smoothness."

In addition, "Carburetor ice can be detected by a drop in rpm in fixed pitch propeller airplanes and a drop in manifold pressure in constant speed propeller airplanes. In both types, usually there will be a roughness in engine operation."

Special Airworthiness Information Bulletin (SAIB) CE-14-23

On August 6, 2014, the FAA issued the SAIB, "information only, recommendations are not mandatory," to alert owners, operators and maintenance technicians of an airworthiness concern, "specifically structural deterioration and possible collapse of the air inlet hose. The air inlet hose may be between the air filter and the fuel injector, carburetor or carburetor heat box depending on the airplane model. A collapsed hose reduces airflow to the engine and could result in a rough running engine or a loss of power." Postaccident examination of the air inlet hose, revealed that it was not collapsed.

Ditching

The pilot indicated that he was concerned that if he landed in deeper water, the fixed landing gear airplane would flip over.

No substantive documentation could be located in FAA archives regarding the probability of successfully ditching an airplane. Thus, the NTSB requested that the FAA provide any policy that addressed protecting lives and property on the ground during a loss of engine power. The request was made not only in reference to this accident, but also to a similar accident that occurred in Hilton Head Island, South Carolina, on March 15, 2010 (NTSB #ERA10LA175). According to the FAA response:

"In the Pilot/Controller Glossary (P/CG), an aircraft emergency is described as 'a distress or urgency condition.' The P/CG further defines distress as 'a condition of being threatened by serious and or/imminent danger and requiring immediate assistance.' Urgency is defined as 'a condition of being concerned about safety and of requiring timely but not immediate assistance; a potential distress condition.'

Title 14 of the *Code of Federal Regulations* includes several requirements intended, in whole or in part,

to protect lives and property other than the occupants of the aircraft. Section 91.119 describes minimum safe altitudes for operations under part 91; those regulations principally require all operations to be at an altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface. That regulation further specifies operational restrictions in congested areas. Section 91.13 prohibits any person from operating an aircraft in a way that endangers the life or property of another.

While not regulatory, Chapter 16 of the FAA's Airplane Flying Handbook (FAA-H-8083- 3A) describes the human factors elements associated with pilots selecting between forced landing sites, including forced landings on water (ditching).

The accidents described in the NTSB's request appear to be the result of a PIC decision to land on a hard surface rather than in the water. In these cases, the only available surfaces may have been the body of water and the beach. Most pilots will instinctively look for the largest available flat and open area for an emergency landing. While ditching an aircraft is not necessarily more unsafe than a beach landing, when other options exist, pilots may tend to avoid ditching an aircraft.

Ditching generally involves total loss of the aircraft, and the sudden deceleration, likelihood the aircraft overturning on touchdown, and subsequent cockpit egress difficulties can further influence this decision. A beach can also appear deceptively attractive to a pilot who is forced to make an instantaneous emergency landing decision. A beach surface is somewhat level, usually with no fixed obstacles, and can be assumed to be safe for the aircraft occupants and preservation of the aircraft. These conditions can cause a pilot to overlook the density of people on such a surface.

Because of the variety of possible emergency situations, it is impractical to apply a specific policy addressing risks involved between beach landings and ditching. The FAA relies on its requirements for pilot training on aeronautical decision making to compel pilots to pursue courses of action in an emergency which appear to be the safest and most appropriate under the circumstances."

Administrative Information

Investigator In Charge (IIC):	Cox, Paul
Additional Participating Persons:	William J Stokes; FAA/FSDO; Tampa, FL Ronald Maynard; Piper Aircraft; Vero Beach, FL J. Michael Childers; Lycoming Engines; Williamsport, PA
Original Publish Date:	May 1, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89746