Aviation Investigation Final Report

Location:	Poughkeepsie, New York	**Accident Number:**	ERA19LA231
Date & Time:	July 19, 2019, 14:40 Local	**Registration:**	N811SK
Aircraft:	Piper PA46	**Aircraft Damage:**	Substantial
Defining Event:	Fuel exhaustion	**Injuries:**	3 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was in cruise flight at an altitude of 19,000 feet mean sea level (msl) for about 1 hour and 10 minutes on an easterly heading when he requested a diversion from his filed destination to an airport along his route of flight to utilize a restroom. Two miles west of his amended destination at 12,000 ft msl, the pilot advised the controller that he had a “fuel emergency light" and wanted to expedite the approach. The controller acknowledged the low fuel warning and cleared the airplane to descend from its assigned altitude. Instead of conducting the descent over the airport, the airplane continued its easterly heading past the airport for nearly 8 miles before reversing course. After reversing course, instead of assuming a direct heading back to the airport, the pilot assumed a parallel reciprocal track and didn’t turn for the airport until the airplane intercepted the extended centerline of the landing runway. The pilot informed the controller that he was unable to make it to the airport and performed a forced landing less than 1 mile from the landing runway.

Both fuel tanks were breached during the accident sequence, and detailed postaccident inspections of the airplane’s fuel system revealed no leaks in either the supply or return sides of the system. A computer tomography scan and flow-testing of the engine-driven fuel pump revealed no leaks or evidence of fuel leakage. The engine ran successfully in a test cell. Data recovered from an engine and fuel monitoring system revealed that, during the two flights before the accident flight, the reduction in fuel quantity was consistent with the fuel consumption rates depicted at the respective power settings (climb, cruise, etc). During the accident flight, the reduction in fuel quantity was consistent with the indicated fuel flow throughout the climb; however, the fuel quantity continued to reduce at a rate consistent with a climb power setting even after engine power was reduced, and the fuel flow indicated a rate consistent with a cruise engine power setting. The data also showed that the indicated fuel quantity in the left and right tanks reached 0 gallons within about 10 minutes of each other, and shortly before the accident. Given this information, it is likely that the engine lost power

due to an exhaustion of the available fuel supply; however, based on available data and findings of the fuel system and component examinations, the disparate rates of indicated fuel flow and fuel quantity reduction could not be explained.

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 due to fuel exhaustion as the result of a higher-than-expected fuel quantity reduction. Contributing was the pilot's continued flight away from his selected precautionary landing site after identification of a fuel emergency, which resulted in inadequate altitude and glide distance available to complete a successful forced landing.

Findings

Aircraft	Fuel - Unknown/Not determined
Aircraft	(general) - Unknown/Not determined
Personnel issues	Decision making/judgment - Pilot

Factual Information

History of Flight

Enroute	Fuel exhaustion (Defining event)
Emergency descent	Landing area overshoot

On July 19, 2019, about 1440 eastern daylight time, a Piper PA46-310P, N811SK, was substantially damaged when it was involved in an accident near Hudson Valley Regional Airport (POU), Poughkeepsie, New York. The private pilot and two passengers were seriously injured, and one passenger sustained minor injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Radar and voice communication data obtained from the Federal Aviation Administration (FAA) revealed that the airplane departed Akron-Fulton International Airport (AKR), Akron, Ohio, about 1248. About 25 minutes later, it had climbed to 19,000 ft, where it remained in cruise flight for about 1 hour and 10 minutes on a heading between 080 and 085°. At 1428:21, the pilot requested a diversion from his filed destination to POU to utilize a restroom. The Boston air route traffic control center controller approved the diversion to POU and issued altitude and heading clearances. About 1432, the radar target identified as the accident airplane had descended to 13,200 ft, where it turned slightly right and tracked directly toward POU.

At 1433:38, the airplane was located 2 miles west of POU, about 12,000 ft and 200 knots groundspeed, and in communication with the New York Terminal Radar Approach Control when the pilot stated, "...we are getting a ah fuel emergency light at this time so ah just want to expedite our approach in there." The controller acknowledged the low fuel warning and cleared the airplane to descend from its assigned altitude of 6,000 ft to 3,000 ft. The airplane crossed directly over POU at 11,700 ft and continued its easterly heading.

At 1435:37, the airplane was about 5 miles east of POU at 8,100 ft, when the pilot requested a turn back to the airport. At 1435:46, the controller advised a direct turn back at "your discretion," and 2 minutes later cleared the airplane for a visual approach.

At 1436:32, the airplane was at an altitude of 6,300 ft and 170 knots groundspeed about halfway through the course reversal back to POU, which was 7.4 miles to the west. Sky Acres Airport (44N), Lagrangeville, New York was 3.7 miles directly in front of the airplane at that time.

After completing the course reversal, the airplane tracked parallel to its eastbound track on a westerly heading.

At 1437:46, about 5 miles northeast of POU at 3,550 ft and 135 knots groundspeed, the pilot advised the POU tower controller that he was performing a visual approach to runway 24.

At 1438:44, 2 miles northeast of the airport about 1,500 ft, the airplane turned towards POU as it intercepted the inbound course to the landing runway.

At 1439:32, the tower controller advised the airplane that its landing gear appeared to be retracted. The pilot responded, "we are too low we are not going to make it."

There were no further communications with the airplane, and the final radar target was depicted at 350 ft and 93 knots about .75 miles from the landing runway which was at 163 ft elevation.

The airplane was equipped with a JPI EDM-900 engine data monitor, which was retained and downloaded. Examination of the data revealed that, during the two flights before the accident flight, the reduction in fuel quantity was consistent with the fuel consumption rates depicted at all power settings (climb, cruise, etc). During the accident flight, the reduction in fuel quantity was consistent with the indicated fuel flow throughout the climb; however, the fuel quantity continued to reduce at the “climb rate” even after engine power was reduced, and the fuel flow indicated a rate consistent with a cruise engine power setting. Between 1427 and 1428, the indicated quantity of fuel in the left tank reached 0, followed by the right fuel tank between 1437 and 1438.

Pilot Information

Certificate:	Private	**Age:**	50,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	May 15, 2019
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1300 hours (Total, all aircraft), 300 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N811SK
Model/Series:	PA46 310P	**Aircraft Category:**	Airplane
Year of Manufacture:	1985	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	46-8508046
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:	March 12, 2019 Annual	**Certified Max Gross Wt.:**	4101 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2641 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:		**Engine Model/Series:**	TSIO-550-C (1B)
Registered Owner:	On file	**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KPOU,163 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	14:53 Local	**Direction from Accident Site:**	70°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots / 15 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	220°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.81 inches Hg	**Temperature/Dew Point:**	33°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Akron, OH (AKR)	**Type of Flight Plan Filed:**	IFR
Destination:	Poughkeepsie, NY (POU)	**Type of Clearance:**	VFR
Departure Time:	12:48 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	Dutchess County POU	**Runway Surface Type:**	Dirt;Grass/turf
Airport Elevation:	163 ft msl	**Runway Surface Condition:**	Rough;Vegetation
Runway Used:	25	**IFR Approach:**	None
Runway Length/Width:	1358 ft / 100 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Serious, 1 Minor	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	3 Serious, 1 Minor	**Latitude, Longitude:**	41.626667,-73.884162(est)

Initial examination of the airplane at the accident site was performed by an FAA inspector. The airplane came to rest upright among trees and brush. The airplane's right wing displayed significant impact damage, was separated at its root, and came to rest immediately adjacent to the fuselage. The left wing appeared attached and largely intact. The location of the wreckage precluded further examination at the accident site.

Examination of the wreckage was performed by NTSB investigators after recovery. The fuselage remained intact and exhibited crush damage on the forward section. In addition, buckling was noted in the airframe. The left windscreen was fully cracked but still attached to airframe. The right windscreen was undamaged. The fuel selector valve and the fuel selector handle were in the left tank position.

The airplane wings were separated from the fuselage by impact or cut from the fuselage during recovery. Visual inspection of the on-wing fuel drains and filler caps revealed no evidence of fuel leakage.

Flight control continuity was confirmed from the flight controls to all flight control surfaces. Continuity was confirmed through breaks due to impact and disassembly by recovery personnel.

The outlet port from the electric boost pump in the left wing was disconnected and compressed air was blown through the selector valve to the fuel strainer. The selector handle lever was moved to the right tank position, the fuel selector valve moved, and air was blown from the fuel line at the base of the right wing strut to the fuel filter bowl without obstruction.

Both the left and right tanks fuel finger strainers were unobstructed and contained no debris. The right and left fuel tanks were breached, but each fuel cap was secure in its respective fuel port. The fuel strainer bowl was drained of about 6 oz of rust-colored water. About 1 oz of 100LL aviation gasoline appeared suspended in the water.

A second examination was performed by an NTSB investigator and an NTSB Senior Systems Engineer. The group examined and identified the fuel system lines from the fuel selector valve (at the right wing inboard root) forward to the engine compartment. The lower right forward fuselage skin was cut away to provide access to the entire length of the fuel supply and vapor (return) lines. The lines displayed some bending and crimping due to impact damage, but no voids in the lines were visible. Both fuel tanks had been breached. No evidence of fuel leakage or streaks were noted on the removed skin.

The fuel selector valve could be operated by hand and was selected from left and right with no defects noted. The fuel return line was checked by inserting compressed air and soapy water into the return line near the engine firewall. Compressed air was then used to force the water mixture through the return lines to check for breaches or leaks in the line. No leaks or breaches were noted. Using the selector valve, soapy water was moved out to each respective wing return line.

Both the first and second inspections of the airplane's fuel system revealed no leaks in either the supply or return sides of the fuel system.

The engine was removed from the wreckage during the initial wreckage exam and shipped to the manufacturer for inspection and testing. The engine-driven fuel pump remained attached to the engine and the fuel lines and other interfaces were cut to aid in removal and packaging. Sections of the fuel supply and vapor return lines remained with the engine until installation in the engine test stand.

The engine was placed in a test cell, where it started, but would not run continuously without use of the engine test stand boost pump. Removal and disassembly of the engine-driven fuel pump revealed that it was contaminated with debris and corrosion, which prevented normal rotation, and the pump's drive coupling was fractured. The damage to the coupling was consistent with overstress induced at engine start. Once the pump was replaced, the engine started immediately, accelerated smoothly, and ran continuously without interruption.

The pump was reassembled, and CT scan images revealed no voids or faults that would allow fuel leaks. The pump was then flow tested and exhibited no leaks.

Two examinations of the fuel system as well as CT scan and flow-testing of the engine-driven fuel pump revealed no leaks or evidence of fuel leakage.

Additional Information

According to the FAA Airplane Flying Handbook, Chapter 17, Emergency Procedures:

Precautionary landing—a premeditated landing, on or off an airport, when further flight is possible but inadvisable. Examples of conditions that may call for a precautionary landing include deteriorating weather, being lost, fuel shortage, and gradually developing engine trouble.

A precautionary landing, generally, is less hazardous than a forced landing because the pilot has more time for terrain selection and the planning of the approach. In addition, the pilot can use power to compensate for errors in judgment or technique. The pilot should be aware that too many situations calling for a precautionary landing are allowed to develop into immediate forced landings, when the pilot uses wishful thinking instead of reason, especially when dealing with a self-inflicted predicament. The non-instrument-rated pilot trapped by weather, or the pilot facing imminent fuel exhaustion who does not give any thought to the feasibility of a precautionary landing, accepts an extremely hazardous alternative.

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	Wayne VanSteenburg; FAA; Teterboro, NY
Original Publish Date:	June 14, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99897