Aviation Investigation Final Report

Location:	Roy, Utah	**Accident Number:**	WPR20FA065
Date & Time:	January 15, 2020, 15:11 Local	**Registration:**	N5805M
Aircraft:	Cessna T310	**Aircraft Damage:**	Substantial
Defining Event:	Fuel related	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot was conducting a personal flight to relocate the twin-engine airplane back to his home base following maintenance. A leak check on the left-wing tip fuel tank was also performed prior to the flight. About 2 1/2 gallons of fuel was added to the tank to perform the leak check. According to a witness, the pilot did not refuel the airplane prior to the accident flight.

Another witness reported hearing popping sounds as the airplane approached the destination airport and thought that one of the engines was trying to restart while it flew overhead. The witness also stated that the landing gear and flaps were extended. A third witness saw that the airplane was in a yaw to the left and appeared to be struggling to stay airborne. Subsequently, the airplane's left wing dropped, the airplane momentarily stabilized, and the left wing dropped again, banking the airplane further to the left. The airplane continued to the left when the nose dropped and was soon out of view.

Postaccident examination of the airplane revealed that the left propeller blades exhibited minimal rotational signatures, which is consistent with the left engine producing low-to-no power at the time of impact. The visual evidence indicated the left propeller was not feathered at the time of impact, which was counter to procedures indicated for operating with one engine inoperative during flight. The right propeller blades showed evidence of the engine operating at mid-to-low power at the time of impact. Examination of the airframe and engines revealed no evidence of preaccident mechanical malfunctions or anomalies that would have precluded normal operation. It is likely that during the flight, the left-wing tip fuel tank's remaining fuel was exhausted, resulting in the loss of power to the left engine. Available evidence suggests that the left engine shut down during flight due to fuel starvation, resulting in the airplane yawing to the left with a decrease in performance followed by banking left.

The pilot was known to land the airplane on a single engine on multiple occasions. He was also described as not likely to declare a flight emergency because of the paperwork involved. It is likely after he lost power to the left engine, the pilot continued his approach to his destination without declaring an emergency. As the flight continued there was a loss of airspeed, which resulted in the airplane entering multiple aerodynamic stalls, which precipitated the final left turn toward the accident site.

Probable Cause and Findings

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

The pilot's inadequate preflight fuel planning and fuel management, which resulted in a total loss of power to the left engine due to fuel exhaustion. Also causal was the pilot's failure to follow the one-engine inoperative checklist and maintain the airplane's minimum controllable airspeed by properly configuring the airplane, which resulted in a loss of airplane control.

Findings

Aircraft	Fuel - Fluid level
Personnel issues	Fuel planning - Pilot
Aircraft	Airspeed - Not attained/maintained
Personnel issues	Use of checklist - Pilot

Factual Information

History of Flight

Approach	Fuel related (Defining event)
Approach	Loss of control in flight

On January 15, 2020, about 1511 mountain standard time, a Cessna T-310P airplane, N5805M, was involved in an accident near Ogden, Utah. The pilot was the sole person onboard and was fatally injured. The airplane was operated 14 *Code of Federal Regulations* Part 91 as a local flight.

According to automatic dependent surveillance-broadcast (ADS-B) information, the airplane departed to the north from Skypark Airport (BTF), Bountiful, Utah, and a few minutes later started its approach into Ogden-Hinckley Airport (OGD), Ogden, Utah. OGD is about 22 miles to the north of BTF. The airplane climbed during the flight to an altitude of about 5,200 ft mean sea level (msl) and reached a maximum airspeed of 145 mph. It then began a series of short descents and climbs, loosing airspeed on each climb, and partially regaining it on the descent. The final airspeed recorded was at 79 mph about a mile south of OGD.

Several witnesses reported that they saw the airplane and noticed how slow it seemed to be when it was flying northbound, parallel, over the interstate highway I-15. An eyewitness who was in a store adjacent to the interstate, and about 1-1/2 miles south of OGD, heard the airplane while inside the store and went outside to get a better view. The witness described the sound as “popping,” and he thought that one of the engines was trying to be restarted. The witness reported that the airplane was flying northbound above the interstate at about 150 ft to 200 ft above the ground, and that the landing gear and the flaps were extended. A second eyewitness at the same location took a photo as the airplane flew overhead. (See figure 1.) As the first eyewitness watched the airplane continue to fly north and away from his location, he saw that the airplane was “crabbing” to the left and that it seemed to be struggling to stay airborne. While it was crabbing, he could see the left side of the airplane’s fuselage and noticed that the tail section seemed to be lower than normal. Subsequently, the airplane’s left wing dropped, the airplane momentarily stabilized, and the left wing dropped again, banking the airplane further to the left. The airplane crossed to the other side of the interstate, where the nose dropped, and where he soon lost sight of it.

Figure 1-Eyewitness photograph of the accident airplane.

A forward-facing car dash camera in an automobile driving northwest on a road paralleling the interstate, captured the airplane as it was flying northbound, paralleling the interstate. The airplane was flying away from the camera, appeared to be about 100 ft above the ground, with the wings level and the landing gear extended.

A doorbell surveillance camera captured the airplane in a nose-down, left wing down attitude, about 50 ft above the ground prior to impact. The sound of the airplane was also heard. A fire explosion was visible during the accident sequence from other doorbell cameras in the neighborhood.

A family member reported that the pilot had a vast amount of time and experience in the airplane model and was also known to have landed the airplane with one working engine more than once. During one occasion, the pilot declared an inflight emergency and said that he would never call in an inflight emergency again because of the amounts of paperwork involved because of reporting it.

Pilot Information

Certificate:	Private	**Age:**	64,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	February 1, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 13000 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N5805M
Model/Series:	T310 P	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	310P0105
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2
Airframe Total Time:		**Engine Manufacturer:**	
ELT:		**Engine Model/Series:**	
Registered Owner:	S.A.C Industries LLC	**Rated Power:**	
Operator:	Goode Ski Technologies	**Operating Certificate(s) Held:**	None

The airplane had been at BTF for maintenance and was being relocated by the pilot to OGD where it was based.

On January 10, 14 and 15, 2020, text message communications were sent between the maintenance facility and the pilot. Several photos were sent from the pilot showing the lower side of the left-wing tip fuel tank. A lower wing panel was removed, and blue fuel staining was visible in two areas. On January 15, 2020, the maintenance facility texted the pilot and stated that “the leak checks appear good.” The pilot replied that he would try and be there at the airport between 1300 and 1330 the following day.

An airport employee reported that the pilot had flown into BTF on January 10, 2020, to drop off the airplane so a fuel leak on the left wing tip fuel tank could be repaired. Before the work was performed, about 25 gallons of fuel was drained from the airplane. When the work was completed, about 2 1/2 gallons of fuel was added to the tip fuel tank to complete a leak check on the tank and its connections. The employee further reported that the pilot came in and picked up the airplane on the day of the accident. They spoke about how much fuel was remaining in the wing tip fuel tank. The pilot did not refuel the airplane, as confirmed by fueling records, and subsequently departed on the accident flight.

Maintenance records revealed that the airplane's left main tank was repaired by installing a new gasket and O-ring in the fuel outlet fitting. After the repair and proper cure time of sealant, 2 1/2 gallons of fuel was added to the tank to complete a leak check.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KOGD,4439 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	43°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.17 inches Hg	**Temperature/Dew Point:**	-7°C / -13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bountiful, UT (BTF)	**Type of Flight Plan Filed:**	None
Destination:	Ogden, UT (OGD)	**Type of Clearance:**	VFR
Departure Time:	15:00 Local	**Type of Airspace:**	Air traffic control

Airport Information

Airport:	Ogden-Hinckley OGD	**Runway Surface Type:**	Asphalt
Airport Elevation:	4472 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	35	**IFR Approach:**	None
Runway Length/Width:	5195 ft / 100 ft	**VFR Approach/Landing:**	Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:		**Aircraft Explosion:**	Unknown
Total Injuries:	1 Fatal	**Latitude, Longitude:**	41.194999,-112.012222(est)

Examination of the accident site revealed that the first identified point of contact was the southwest corner of a roof of a townhome complex. The debris field continued at the front yard of the same townhome and along the street. The debris field was about 135 ft long and on a directional heading of about 210° magnetic. The first identified point of contact was the left fuel tank which was found embedded in the roof of the townhome. A 20 ft tall tree near the townhome was damaged and sections were found throughout the debris field. The main wreckage was found along the street where it came to rest upright on a rock retaining wall. The main wreckage had impact and fire damage, with the cabin area mostly consumed by fire. The engines were found separated from their mounts but remained attached to the airframe by cables and tubing. The fuel selector valves were found in the “OFF” position. The visual evidence indicated the left propeller was not feathered at the time of impact with the ground. The left propeller assembly blades were examined. One of the left propeller blades had rotational scoring and bending. The other two left propeller blades had slight bending near their tips. The right propeller assembly had blades that showed rotational scoring and impact damage. A postaccident examination of the airframe and engines revealed no evidence of preaccident mechanical malfunctions or anomalies that would have precluded normal operation.

Communications

According to OGD air traffic control tower (ATCT) personnel, the pilot checked in with the OGD tower when the airplane was about 9 miles south of OGD. The pilot reported that he was inbound from BYF and requested a full-stop landing. Subsequently, the ATCT controller obtained clearance for the pilot to transition into Hill Air Force Base (HIF) airspace for the approach. About 2 miles from the airport, the pilot reported that he was 2 miles out and the controller cleared the pilot for the landing on OGD runway 35. The pilot read back the instruction to the controller. According to the controller, at this point, the communication between the pilot and the controller was reported as normal. The controller used his binoculars to view the airplane and verify that the airplane's landing gear was down for the landing. While viewing the airplane, he saw the airplane initiate a steep left banking turn, followed by a steep bank to the right while losing altitude, after which the controller lost sight of the airplane. A short inaudible sound was made over the radio. No further communication from the pilot was reported.

Tests and Research

Airplane Performance

Data from the airplane's owner's manual was available for loss of one or both engines. With one engine lost, the minimum single engine control speed is reported as 90 mph, indicated airspeed (IAS), and the safe single-engine speed is 105 mph. The owner's manual advises that for a single-engine approach and landing, the approach speed should be 113 mph, IAS, with excessive altitude. If both engines are lost, the maximum glide was reported as a mile for every 500 ft of altitude, gear and flaps up and to maintain approximately 120 mph, IAS.

A performance study revealed that after the initial climb from BTF the airplane began a series of short descents and climbs, losing airspeed on each climb, and partially regaining it on the descent. The overall airspeed slowed from more than 140 mph to under 90 mph. As the airplane approached OGD, it was below the glide slope for runway 35 and slowed below its aerodynamic stall speeds.

Sound Spectrum Analysis

The doorbell surveillance camera audio was used in a sound spectrum analysis report. The report suggests that at least at least one propellor was operating at approximately 2,430 RPM as the aircraft reached the closest point of approach to the camera. As the aircraft approached

the camera, the observed frequency decreased during this time, which may have been due to the Doppler effect. Potential acoustic beating was observed throughout the short audio recording, which could indicate that both propellors were operating at or around the same blade passage frequency.

Administrative Information

Investigator In Charge (IIC):	Swick, Andrew
Additional Participating Persons:	Robert Williams; FAA-FSDO; Salt Lake City, UT Ricardo Asensio; Textron Aviation; Wichita, KS Mike Council; Continental Aerospace Technologies; Mobile, AL
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