Aviation Investigation Final Report

Location:	Jackson, Tennessee	**Accident Number:**	ERA20LA313
Date & Time:	September 11, 2020, 02:52 Local	**Registration:**	N74HS
Aircraft:	Beech A36	**Aircraft Damage:**	Substantial
Defining Event:	Fuel exhaustion	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The airplane was enroute during a night cross-country flight when the pilot reported to air traffic control that he was low on fuel and needed to divert to a nearby airport. The controller approved the pilot's request, and there were no additional communications from the pilot. The wreckage of the airplane was later located in a wooded area near the divert airport. Examination of the airframe and engine revealed no evidence of fuel at the accident scene and no evidence of pre-accident anomalies that would have precluded normal operation of the airplane before the accident.

Fuel computations based on refueling records, previous flights, and estimated fuel burn rates showed the engine likely consumed all usable fuel onboard. Additionally, data downloaded from an onboard engine monitor recorded the fuel flow decreasing to zero about 6 minutes before the data ended.

The pilot's report to air traffic control that he was low on fuel, the onboard engine monitor data showing fuel flow drop to zero, and the lack of fuel at the accident scene all indicate the pilot departed with insufficient fuel onboard to complete his planned flight. This resulted in a total loss of engine power due to fuel exhaustion and impact with terrain.

The pilot's toxicology showed that ethanol was present in his femoral blood at nearly three times the regulatory limit for flying. Ethanol was also present in the pilot's vitreous indicating that the ethanol was likely from ingestion and representative of his blood alcohol level at the time of the crash. Vitreous is relatively unsusceptible to postmortem ethanol production, and the measured proportion of ethanol in vitreous compared to femoral blood fits a typical pattern seen after consumed ethanol is absorbed. The pilot's decision to fly with insufficient fuel to reach his destination was consistent with the known impairing effects of ethanol on awareness, decision making, and performance. Thus, effects from ethanol likely contributed to the accident.

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, which resulted in a total loss of engine power due to fuel exhaustion. Contributing to the accident was the pilot's impairment due to alcohol.

Findings

Aircraft	Fuel - Fluid level
Personnel issues	Fuel planning - Pilot
Personnel issues	Alcohol - Pilot

Factual Information

History of Flight

Enroute	Fuel exhaustion (Defining event)
Emergency descent	Collision with terr/obj (non-CFIT)

On September 11, 2020, about 0252 central daylight time, a Beech A36, N74HS, was substantially damaged when it was involved in an accident near McKellar-Spies Regional Airport (MKL), Jackson, Tennessee. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to FAA inspectors, the evening before the accident, the pilot flew the airplane from Charles W Baker Airport (2M8), Millington, Tennessee, which was his home airport, to Dickson Municipal Airport (M02), Dickson, Tennessee, arriving about 2035 on September 10, 2020.

According to the manager at M02, surveillance video showed that upon arrival, the airplane taxied to the fuel farm, and the pilot exited the airplane and walked up to the fuel pump. He then returned to the airplane, started it, and taxied to the parking area. The manager stated that the fuel farm was operated by the fixed-base operator (FBO), and the pump was locked. The manager further stated that there was a sign on the FBO door advising anyone looking to purchase fuel to call an afterhours telephone number for service.

The M02 surveillance video showed the airplane about 0200 on September 11, 2020, taxiing back to the fuel farm, but the pilot did not exit the airplane. The airplane remained idling for about 3 minutes outside the fuel farm and departed the airport about 0206. According to the FAA, the pilot had filed a visual flight rules (VFR) flight plan from M02 to 2M8.

About 0248, the pilot requested a deviation from air traffic control to land at MKL. He advised the controller that he was experiencing a fuel issue, stating “we’re just a little low on fuel,” and needed to land. The controller provided a heading vector towards MKL and asked the pilot to report when he had the airport in sight. The pilot turned to the new heading, and flight track data showed the airplane began a descent from about 6,000 ft. No further communications were received from the pilot, and the last flight track data point recorded was at 0252 at an altitude of 525 ft.

The Federal Aviation Administration (FAA) subsequently issued an Alert Notice (ALNOT), and the airplane was located later that morning about 1.5 miles west of MKL in a wooded area.

An inspection of the accident site by FAA inspectors revealed that the airplane had impacted trees and terrain and that all major components of the airplane were located at the accident site. The airplane was substantially damaged with the engine, propeller, and nose gear separated at the firewall and the right wing separated near the fuselage. There was no odor of fuel at the accident site. No fuel was found in the left fuel tank, and it was not breached. The right fuel tank was breached. The fuel inlet line attached to the manifold valve was removed and was absent of fuel. A trace amount of fuel was found in the engine driven

fuel pump inlet line. Further examination of the airframe and engine after recovery revealed no evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation.

A JPI engine data monitor was recovered from the wreckage and downloaded by the National Transportation Safety Board (NTSB) Vehicle Recorders Laboratory. Fuel flow rates indicated that about 0245, the flow dropped from 8.3 gallons per hour to 6 gallons per hour and then to 0. Fuel flowed intermittently at rates of 0.2 to 0.4 gallons per hour until 0247, at which time the fuel flow dropped to 0 and remained there until the engine data monitor stopped recording at 0251.

FAA inspectors collected the fueling records for the airplane and verified them using the pilot's credit card statement records. The last known refueling event was on August 23, 2020, when the airplane was fueled with 43.0 gallons of 100LL aviation fuel at 2M8 airport. The airplane was flown 5.1 hours between the last refueling and the accident. The airplane had a usable fuel capacity of 74 gallons, which provided about 5 hours of flight time at a fuel burn rate of 15 gallons per hour.

The Office of the Medical Examiner, Center for Forensic Medicine, Nashville, Tennessee, performed the pilot's autopsy. According to the autopsy report, the cause of death was multiple blunt force injuries. The autopsy did not identify any significant natural disease.

Two laboratories performed toxicological testing on specimens from the pilot. One laboratory identified ethanol at 0.119 grams per deciliter (g/dL) in femoral blood and 0.149 g/dL in vitreous. The other laboratory identified ethanol at 0.103 g/dL in cavity blood and 0.156 g/dL in vitreous. Ethanol is the intoxicating alcohol in beer, wine, and liquor. It can impair judgment, psychomotor performance, cognition, perception, and vigilance. FAA regulation prohibits any person from acting as a crewmember of a civil aircraft within 8 hours of consuming an alcoholic beverage or while having a blood ethanol level of 0.04 g/dL or greater. In general, the number and seriousness of pilot errors increase with blood ethanol level. Ethanol can also be produced by microbes in a person's body after death.

Pilot Information

Certificate:	Private	**Age:**	47,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
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:**	April 21, 2020
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 366 hours (Total, all aircraft), 200 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N74HS
Model/Series:	A36 UNDESIGNAT	**Aircraft Category:**	Airplane
Year of Manufacture:	1991	**Amateur Built:**	
Airworthiness Certificate:	Utility	**Serial Number:**	E-2659
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	3651 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental
ELT:		**Engine Model/Series:**	IO-550-B (45)
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:	MKL,422 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	02:53 Local	**Direction from Accident Site:**	65°
Lowest Cloud Condition:	Clear	**Visibility**	5 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	19°C / 18°C
Precipitation and Obscuration:	Moderate - None - Mist		
Departure Point:	Dickson, TN (M02)	**Type of Flight Plan Filed:**	VFR
Destination:	Jackson, TN (MKL)	**Type of Clearance:**	VFR
Departure Time:	02:06 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Mc Kellar-Sipes Rgnl MKL	**Runway Surface Type:**	
Airport Elevation:	433 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	35.584445,-88.940002(est)

Administrative Information

Investigator In Charge (IIC):	Wentz, Peter
Additional Participating Persons:	Bradley J Gottschalk; FAA FSDO; Memphis, TN Kurt A Gibson; Continental Aerospace; Mobile, AL Ricardo J Asensio; Textron Aviation; Wichita, KS
Original Publish Date:	October 5, 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=101948

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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.