Aviation Investigation Final Report

Location:	Kokomo, Indiana	**Accident Number:**	CEN20FA002
Date & Time:	October 5, 2019, 16:37 Local	**Registration:**	N326CW
Aircraft:	Piper AEROSTAR 602P	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

The airline transport pilot arrived at the departure airport in the reciprocating engine-powered airplane where it was fueled with Jet A jet fuel by an airport employee/line service technician. A witness stated that she saw a "low flying" airplane flying from north to south. The airplane made a "sharp left turn" to the east. The left wing "dipped low" and she then lost sight of the airplane, but when she approached the intersection near the accident site, she saw the airplane on the ground. The airplane impacted a field that had dry, level, and hard features conducive for an off-airport landing, and the airplane was destroyed.

The wreckage path length and impact damage to the airplane were consistent with an accelerated stall.

Postaccident examination of the airplane found Jet A jet fuel in the airplane fuel system and evidence of detonation in both engines from the use of Jet A and not the required 100 low lead fuel. Use of Jet A rather than 100 low lead fuel in an engine would result in detonation in the cylinders and lead to damage and a catastrophic engine failure. According to the Airplane Flying Handbook, the pilot should witness refueling to ensure that the correct fuel and quantity is dispensed into the airplane and that any caps and cowls are properly secured after refueling.

Probable Cause and Findings

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

The pilot's exceedance of the airplane's critical angle of attack following a dual engine power loss caused by the line service technician fueling the airplane with the wrong fuel, which

resulted in an aerodynamic stall and subsequent loss of control. Contributing was the pilot's inadequate supervision of the fuel servicing.

Findings

Personnel issues	Incorrect action performance - Ground crew
Aircraft	Fuel - Incorrect use/operation
Personnel issues	Lack of action - Pilot
Personnel issues	Aircraft control - Pilot
Aircraft	Angle of attack - Capability exceeded

Factual Information

History of Flight

Prior to flight	Fuel contamination
Maneuvering	Fuel contamination
Maneuvering	Loss of control in flight (Defining event)
Maneuvering	Aerodynamic stall/spin
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On October 5, 2019, about 1637 eastern daylight time, a Piper Aerostar 602P, N326CW, was destroyed when it was involved in an accident near Kokomo, Indiana. The airline transport pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 business flight.

According to the airport employee who fueled the airplane, during the pilot's approach to the Kokomo Municipal Airport (OKK), Kokomo, Indiana, he asked if the pilot wanted jet fuel, and the pilot said "yes." He said that the airplane looked like a jet airplane. When the airplane arrived, the employee parked the Jet A fuel truck in front of the airplane while the pilot was still inside the airplane. The employee said that he asked the pilot again if he was wanted jet fuel, and the pilot said "yes."

The employee fueled the airplane with about 163 gallons of Jet A from the fuel truck. The employee said that he was able to orient the different-shaped nozzle (relative to the 100 low lead fuel truck nozzle) from the Jet A fuel truck by positioning it 90° over the wing fuel tank filler necks and about 45° over the fuselage filler necks. He said that he initially spilled about 1 gallon of fuel during refueling and adjusted his technique so subsequent fuel spillage was minimal.

The student pilot, who received recurrent training from the accident pilot, said that when she arrived in her vehicle to meet the accident pilot, he was walking between the fuel truck that was parked by the airplane and her vehicle. She said that the accident pilot began training right away about 1045. They completed training, and after 1630, the student pilot drove the accident pilot to the airplane. The student pilot said the accident pilot visually checked the fuel tanks of the airplane to ensure they were fueled up and gave a "thumbs-up" to the student pilot. The student pilot did not stay for the rest of the accident pilot's preflight inspection and drove off. The student pilot heard the engines start and "they sounded normal." The student pilot did not see the takeoff. The student pilot said the winds favored runway 14, which was in use on the day of the accident.

A witness, on a nearby road, stated that she saw a "low flying" airplane flying from north to south. The airplane made a "sharp left turn" to the east. The left wing "dipped low" and she

then lost sight of the airplane, but when she approached the intersection near the accident site, she saw the airplane on the ground.

The airport employee said that he was inside the fixed base operator building about 1620 when he heard the engines start. After the engines started, the engines sounded "typical." He said that he did not hear any radio transmissions from the pilot during his departure and did not hear an engine runup.

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	59,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	November 9, 2018
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	7500 hours (Total, all aircraft)		

There were no pilot records provided to the National Transportation Safety Board (NTSB) Investigator-in-Charge (IIC) indicating the pilot's flight experience and a recent flight review as required under Part 61.56 received from the accident pilot's wife after two requests were made to her.

On November 28, 2008, the pilot was involved in an aviation accident that was investigated under NTSB accident identification number: ERA09CA073.

On December 2, 2016, the Federal Aviation Administration terminated the pilot's designation as a pilot examiner due to sub-standard performance while conducting examinations.

On November 9, 2018, the pilot reported his flight experience that included 7,500 total hours and 200 hours in last six months as of his last airman medical exam.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N326CW
Model/Series:	AEROSTAR 602P	**Aircraft Category:**	Airplane
Year of Manufacture:	1981	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	62P08698165008
Landing Gear Type:	Retractable -	**Seats:**	6
Date/Type of Last Inspection:	August 22, 2019 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	3002.3 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:		**Engine Model/Series:**	IO-540-AA1A5
Registered Owner:	Indiana Paging Network Inc	**Rated Power:**	
Operator:	Pilot	**Operating Certificate(s) Held:**	None

The owner of the accident airplane stated he was supposed to receive initial training in the airplane from In Flight Review, Inc., but it never happened for "various reasons." He stated that he never gave permission for the accident pilot to fly the airplane. The owner declined to provide more information as who he gave the airplane keys to.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	OKK,832 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	16:56 Local	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / None	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.01 inches Hg	**Temperature/Dew Point:**	22°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Kokomo, IN (OKK)	**Type of Flight Plan Filed:**	None
Destination:	Kokomo, IN (OKK)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

Airport Information

Airport:	Kokomo Municipal Airport OKK	**Runway Surface Type:**	
Airport Elevation:	832 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	40.474998,-86.063331(est)

On-scene examination of the airplane revealed the airplane wreckage path was about 328 ft in length along an approximate heading of 046° on a dry and hard surfaced fallow bean field. The wreckage and the wreckage path displayed features consistent with an accelerated stall.

On-scene examination revealed the presence of a clear liquid consistent in color, viscosity, oiliness, and odor with that of Jet A jet fuel in a fuselage tank and in the fuel lines leading to the fuel manifolds of both engines. Several of the engine spark plugs exhibited damage consistent with detonation. Flight control continuity was confirmed. The landing gear was in the retracted position.

Additional Information

The Airplane Flying Handbook (FAA-H-8083-38), Chapter 2, Ground Operations, stated in part:

"Jet fuel has disastrous consequences when introduced into AVGAS burning reciprocating airplane engines. A reciprocating engine operating on jet fuel may start, run, and power the airplane for a time long enough for the airplane to become airborne only to have the engine fail catastrophically after takeoff.

Jet fuel refueling trucks and dispensing equipment are marked with JET-A placards in white characters on a black background. Because of the dire consequences associated with misfueling, fuel nozzles are specific to the type of fuel. AVGAS fuel filler nozzles are straight with a constant diameter. However, jet fuel filler nozzles are flared at the end to prevent insertion into AVGAS fuel tanks.

Using the proper, approved grade of fuel is critical for safe, reliable engine operation. Without the proper fuel quantity, grade, and quality, the engine(s) will likely cease to operate. Therefore, it is imperative that the pilot visually verify that the airplane has the correct quantity for the intended flight plus adequate and legal reserves, as well as inspect that the fuel is of the proper grade and that the quality of the fuel is acceptable. The pilot should always ensure that the fuel caps have been securely replaced following each fueling."

"During refueling operations, it is advisable that the pilot remove all passengers from aircraft during fueling operations and witness the refueling to ensure that the correct fuel and quantity is dispensed into the airplane and that any caps and cowls are properly secured after refueling."

On-scene inspection of the fuel truck used to refuel the airplane revealed that the truck had markings "JET A.".

Administrative Information

Investigator In Charge (IIC):	Gallo, Mitchell
Additional Participating Persons:	Christopher House; Federal Aviation Administration; Indianapolis FSDO; Indianapolis, IN
Original Publish Date:	August 24, 2021
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=100366

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.