Aviation Investigation Final Report

Location:	Norfolk, Nebraska	**Accident Number:**	CEN13FA241
Date & Time:	April 27, 2013, 19:59 Local	**Registration:**	N3970T
Aircraft:	Piper PA-28R-180	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

Two witnesses reported seeing an airplane matching the description of the accident airplane flying in the area of the departure airport at very low altitudes about 90 minutes before the accident flight. One witness described the flight profile as similar to "crop-duster type operations, with multiple low-altitude passes." Another witness reported that the airplane departed the airport and climbed to about 1,000 feet and then made a gradual eastbound descent to a low altitude and out of sight. He reported that the airplane reappeared in a very steep left bank and then descended out of sight again. About 3 miles east of the airport, the airplane impacted a 20-foot-high power line, which resulted in the vertical stabilizer separating from the top of the fuselage and the airplane becoming uncontrollable until it impacted terrain. Examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. A parallel set of high-tension power lines with large support poles was located about 1/2 mile east of the impacted power line. As the pilot flew the airplane at a low altitude eastbound, the high-tension power lines likely visually aligned (that is, came within the same line of sight) with the impacted power line. Therefore, it is likely that the pilot was focused on the more prominent high-tension power lines and did not observe the impacted power line.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's decision to fly at a low altitude and his subsequent failure to see and avoid power lines.

Findings

Personnel issues	Decision making/judgment - Pilot
Personnel issues	Monitoring environment - Pilot
Environmental issues	Wire - Awareness of condition

Factual Information

History of Flight

Maneuvering-low-alt flying	Low altitude operation/event
Maneuvering-low-alt flying	Loss of control in flight (Defining event)

On April 27, 2013, at 1959 central daylight time, a Piper PA-28R-180 airplane, N3970T, was substantially damaged during a wire strike and subsequent ground impact near Norfolk, Nebraska. Both occupants, the private pilot and passenger, were fatally injured. The airplane was registered to Pro-Flite Incorporated and was operating under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed and a flight plan was not filed. The flight departed from Norfolk Regional Airport (OFK), Norfolk, Nebraska at 1957.

Multiple witnesses who were piloting radio controlled airplanes on the south end of the airport saw the accident airplane takeoff from Runway 14 at OFK. After climbing to about 1,000 feet above ground level (AGL), the airplane began a steady descent eastbound to a low altitude and out of sight. Seconds later, the airplane reappeared in a steep left bank and then descended out of sight again.

Previous to the accident flight, the pilot and passenger departed Millard Airport (MLE), Omaha, Nebraska, at 1801 for their flight into OFK. About 1830, two witnesses noticed an airplane similar in type, color, and design to the accident plane flying at low altitude about 6 miles southeast of OFK. The first witness noticed this airplane flying about 100 feet AGL, banking left and right to follow a river basin. From a different location, the second witness characterized the airplane's maneuvers as similar to crop duster operations, with multiple low altitude passes about 15 to 20 feet AGL.

Pilot Information

Certificate:	Private	**Age:**	26,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	March 25, 2010
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 25, 2012
Flight Time:	(Estimated) 212 hours (Total, all aircraft), 40 hours (Total, this make and model), 171 hours (Pilot In Command, all aircraft), 41 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft)		

The pilot, age 26, held a private pilot certificate with an airplane single-engine land and instrument ratings. On March 25, 2010, the pilot was issued a Class 1 limited medical

certificate, which required corrective lenses be worn. A review of the pilot's flight logbook indicated that he had logged 212 hours total time, with 40 hours in the make and model of the accident airplane. He had successfully completed the requirements of a flight review on September 25, 2012.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N3970T
Model/Series:	PA-28R-180	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28R-30317
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	January 17, 2013 Annual	**Certified Max Gross Wt.:**	2500 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	9937 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	C91 installed, not activated	**Engine Model/Series:**	I0360 SER
Registered Owner:	PRO-FLITE INC	**Rated Power:**	180 Horsepower
Operator:	PRO-FLITE INC	**Operating Certificate(s) Held:**	None

The accident airplane, a Piper PA28R-180 (serial number 28R-30317) was manufactured in 1977. It was registered with the Federal Aviation Administration (FAA) on a standard airworthiness certificate for normal operations. The airplane showed a total time of 9,937 hours as of the last annual inspection, which was completed on January 17, 2013. The airplane was equipped with a Lycoming IO-360-B1E engine (serial number L29830-51E). As of the last annual inspection, the engine had accumulated a total of 5,629 hours, with 1,449 hours since last major overhaul.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Dusk
Observation Facility, Elevation:	OFK,1527 ft msl	**Distance from Accident Site:**	3 Nautical Miles
Observation Time:	19:56 Local	**Direction from Accident Site:**	260°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.88 inches Hg	**Temperature/Dew Point:**	21°C / 3°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Norfolk, NE (OFK)	**Type of Flight Plan Filed:**	None
Destination:	Omaha, NE (MLE)	**Type of Clearance:**	None
Departure Time:	19:57 Local	**Type of Airspace:**	

The weather observing station at OFK reported the following conditions at 1956: wind 170 degrees at 9 knots, visibility 10 miles, clear skies, temperature 21 degrees Celsius, dew point 3 degrees Celsius, altimeter setting 29.89.

Airport Information

Airport:	Norfolk Regional Airport OFK	**Runway Surface Type:**	
Airport Elevation:	1572 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	41.982223,-97.383056

The wreckage came to rest upright against a line of trees bordering a farm field. The fuselage with the right wing attached was found lying against trees. The left wing remained partially attached by control cables. The engine and its mount were attached to the firewall. The propeller and spinner were separated and laying approximately 8 feet in front of the nose of the airplane.

A severed, 20-foot high power line/wire was located about 1,418 feet from the impact site. The power line ran parallel to a north-south gravel road. A debris path, which included the rotating beacon lens from the top of the vertical stabilizer, was on a heading of 093 degrees from the wire strike. The heading from the wire strike to the wreckage site was 060 degrees, with a line of trees about 50 feet high separating the wire strike and the wreckage site.

The airplane's windshield, top of the fuselage, and leading edge of the vertical stabilizer indicated damage consistent with a wire strike. The vertical stabilizer was found separated from the top of the fuselage. Both the forward and aft fin to fuselage attach bracket rivets were sheared.

The engine power levers (throttle, prop, mixture), were in the mid-travel positions. The horizontal stabilizer trim indicator was in the full nose down position. Flight control continuity was confirmed to all flight control surfaces.

Fuel was observed at all fuel system components and fuel carrying lines were intact with no leaks. All fuel system components were secure on their mounts. During disassembly, no defects or contaminants were observed. The fuel injector nozzles were removed and examined, with no obstructions observed. The engine driven diaphragm fuel pump was removed from its respective mount and discharged fuel when actuated by hand. Spark plugs were observed to have a color consistent with normal combustion, when compared to the Champion Spark Plug Wear Guide.

Both magnetos were secure on their respective mounts. The left magneto was impulsed and furnished spark at all outlet points. The right magneto was rotated by hand and no spark was furnished. During follow on testing, the right magneto was spun using a socket and a spark was observed at all outlet points.

All engine cylinders were visually inspected using a lighted bore scope, with no anomalies noted. The engine pistons displayed a normal carbon deposit on their tops, and the intake and exhaust valves were unremarkable. A turning tool was inserted into the vacuum pump drive pad and the engine was rotated by hand. Thumb suction and compression was obtained at all cylinders and valve train and crankshaft continuity was observed. All accessory gears were observed rotating.

Examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

Medical and Pathological Information

On April 29, 2013, an autopsy was performed on the pilot by a forensics pathologist at the Douglas County Morgue, as authorized by the Madison County Attorney. The cause of death

was attributed to blunt force injuries. The FAA's Civil Aeromedical Institute in Oklahoma City, Oklahoma, performed toxicology tests on the pilot. No carbon monoxide, ethanol, or drugs were detected in the blood.

Tests and Research

About 1/2 mile east of the impacted power line/wire was a set of high tension power lines, also oriented in a north-south direction. From a position west of the impacted power line, the high tension power lines visually align (same line of sight) with the impacted power line. Additionally, the much larger support poles and lines of the high tension power lines were more visually prominent than the impacted power line.

Administrative Information

Investigator In Charge (IIC):	Folkerts, Michael
Additional Participating Persons:	Paul D'Allura; Federal Aviation Administration; Lincoln, NE John Butler; Lycoming Engines; Arlington, TX Ron Maynard; Piper Aircraft Inc.; Vero Beach, FL
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