Aviation Investigation Final Report

Location:	Middleton, Tennessee	**Accident Number:**	ERA14LA409
Date & Time:	August 27, 2014, 08:50 Local	**Registration:**	N5850G
Aircraft:	Cessna A188B	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot was applying chemicals to a soybean field when the airplane struck power lines about 20 ft above the ground. The outboard half of the right wing was severed from the impact with the wires, and the airplane crashed north of the power lines. Data from a handheld GPS recovered at the accident site revealed that the airplane was in level flight, at low altitude, and on a northerly heading when it impacted the wires. Examination of the wreckage revealed no evidence of a preexisting anomaly or malfunction. The propeller blades exhibited signatures consistent with power at the time of impact, and several tree limbs were found along the debris field with smooth, 45-degree cuts. Toxicology testing on the pilot revealed that he was taking medications for hypertension and edema. The pilot had not reported these conditions to the Federal Aviation Administration; however, the autopsy report revealed no evidence of a heart attack or any other incapacitating event.

Probable Cause and Findings

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

The pilot's failure to see and avoid power lines during a low-level aerial application operation.

Findings

Aircraft	Altitude - Not attained/maintained
Personnel issues	Monitoring environment - Pilot
Personnel issues	Identification/recognition - Pilot
Environmental issues	Wire - Awareness of condition

Factual Information

History of Flight

Maneuvering	Controlled flight into terr/obj (CFIT) (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On August 27, 2014, about 0850 central daylight time, a Cessna A188B, N5850G, collided with high voltage power lines and terrain during aerial application operations near Middleton, Tennessee. The commercial pilot received fatal injuries, and the airplane was destroyed. The airplane was operated under the provisions of 14 CFR Part 137 by the pilot. Day, visual meteorological conditions prevailed for the local, aerial application flight, and no flight plan was filed. The flight originated at Bolivar, Tennessee (M08) at 0724.

Reportedly, the pilot was in the process of applying chemical to a soybean field when the accident occurred. There were no witnesses to the accident. The airplane struck high voltage power lines that were about 20 feet above the ground, severing about one-half of the right wing. The airplane then collided with the ground and came to rest in a wooded area adjacent to the field.

Pilot Information

Certificate:	Commercial	**Age:**	73
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	June 12, 2014
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	5370 hours (Total, all aircraft)		

The pilot, age 73, held a commercial pilot certificate with airplane, single engine land ratings. He reported 5,370 hours of total flight time on his latest FAA second class medical certificate application, dated June 12, 2014. His pilot logbooks were not located after the accident.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N5850G
Model/Series:	A188B	**Aircraft Category:**	Airplane
Year of Manufacture:	1973	**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	18801153
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	3300 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Continental
ELT:		**Engine Model/Series:**	IO-520 Series
Registered Owner:	TAYLOR JAMES E	**Rated Power:**	285 Horsepower
Operator:	TAYLOR JAMES E	**Operating Certificate(s) Held:**	Agricultural aircraft (137)

The accident airplane was a Cessna A188B model that was manufactured in 1973. The low-wing, fixed landing gear, tailwheel-equipped airplane was fitted with a Continental IO-520-FcD engine rated at 285 horsepower at 2,700 rpm. The engine was equipped with a McCauley D2A34C two bladed, constant speed propeller.

The airplane was owned by the pilot. The airframe and engine maintenance records were not located after the accident. The FAA inspector reported that the pilot, who was also an airframe and powerplant mechanic, performed the maintenance on the airplane.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	MKL,434 ft msl	**Distance from Accident Site:**	25 Nautical Miles
Observation Time:	08:53 Local	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	26°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bolivar, TN (M08)	**Type of Flight Plan Filed:**	None
Destination:	Bolivar, TN (M08)	**Type of Clearance:**	None
Departure Time:	07:24 Local	**Type of Airspace:**	

McKellar-Sipes Regional Airport, Jackson, Tennessee was located about 25 nautical miles (nm) north of the accident site. The airport elevation was about 434 feet msl. The 0853 surface weather observation (about 2 minutes after the accident) included a clear sky, wind calm, visibility 10 statute miles or greater, temperature 26 degrees C, dew point 22 degrees C, and altimeter setting 30.10 inches of mercury.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	35.184444,-88.895278

The airplane struck high voltage power lines at coordinates 35°10'57.16"N, 088°53'45.38"W. The severed outboard half of the right wing was found on the ground below the power lines. The wreckage debris path was oriented on a 030 degree heading and was about 285 feet in length. The debris path ended with the engine and propeller. The engine broke free of its mounts during the impact sequence and came to rest about 70 to 80 feet beyond the main wreckage. Several tree limbs were found along the debris field with smooth, 45-degree cuts.

Flight control cable continuity was established for the elevators and rudder, and for the ailerons through

multiple cable separations consistent with overload. The elevator trim indicator was near full nose up. The flap handle was found in the retracted position.

The fuel tank was breached. It contained blue-colored fuel that tested negative for water contamination.

Impact damage was observed on the engine, most notably to the front and bottom sides. All six cylinders remained attached to the case. Both left and right magnetos remained attached to the case. They were removed and examined. When spun by hand, both impulse couplings operated normally and a spark was noted on all posts. Examination of the spark plugs revealed normal wear and deposits when compared to a Champion inspection chart.

The fuel pump exhibited impact damage. It was removed from the engine and examined. The drive coupling was intact and the pump drive operated normally when rotated by hand. All fuel injectors remained installed in their respective cylinders. When removed and examined, no blockages were found. Other than impact damage, no anomalies were noted with the throttle body metering unit and the fuel manifold valve.

The engine crankshaft was rotated by hand and compression and suction was observed on all 6 cylinders. Internal engine continuity was confirmed. Valve, rocker arm, and connecting rod operation was normal. Internal examination of the cylinders with a borescope revealed normal operating signatures.

The propeller remained attached to the propeller flange and the flange remained attached to the crankshaft. Both blades remained attached to the hub. One of the blades displayed twisting deformation and polishing of the leading edge and tip. The other blade was bent aft, twisted, and exhibited gouges in the training edge.

Flight recorders

A Garmin GPSMAP 76 hand-portable GPS unit was recovered from the wreckage. The outer case exhibited minor damage. The unit was forwarded to the NTSB Vehicle Recorder Laboratory for examination and data download. The data extracted without difficulty and included 16 sessions from August 23, 2014 through September 2, 2014. The accident flight was recorded starting 12:24:47 UTC and ending at 13:51:09 UTC on August 27, 2014. The device remained at the crash location and continued recording from 13:51:09 UTC to 03:22:12 UTC on August 28, 2014. Data parameters provided by the GPS device included date, time, latitude, longitude, and GPS Altitude.

According to the data, the flight departed the M08 at approximately 0724. The airplane flew multiple passes on a field to the west of the accident site. The airplane was then observed in level flight on a northerly heading at 0850:34, when it crossed the east-west power line at 111 knots ground speed and about 472 feet GPS altitude. The ground elevation at the location of the power line was about 363 feet. Due to the battery on the GPS unit, the data recording may have continued after the accident event.

Medical and Pathological Information

A postmortem examination of the pilot was performed at the Office of the Medical Examiner, West Tennessee Regional Forensic Center, Memphis, Tennessee on August 28, 2014. The autopsy report noted the cause of death as "Multiple blunt force injuries" and the manner of death was "Accident."

Autopsy found evidence of moderate coronary atherosclerosis with right dominant pattern with atherosclerotic narrowing of 50-60% in the left anterior descending coronary artery and 50% in the right coronary artery. There was no fresh clot or evidence of an old or a recent heart attack. There was diffuse atherosclerosis in the blood vessels of the
brain, but again with no significant acute findings.

Forensic toxicology testing was performed on specimens of the pilot by the Federal Aviation Administration (FAA) Bioaeronautical Sciences Research Laboratory (CAMI), Oklahoma City, Oklahoma. The CAMI toxicology report indicated negative for carbon monoxide in the blood and ethanol in the urine. Testing for cyanide was not performed. Amlodipine was detected in the liver, blood, and urine. Hydrochlorothiazide and triamterene were detected in the urine and blood.

Triamterene (Dyrenium®) is a potassium-sparing diuretic used in combination with thiazide (hydrochlorothiazide) diuretics for the treatment of hypertension (high blood pressure) and edema. Hydrochlorothiazide (multiple brand names) is a commonly used diuretic for blood pressure control. Amlodipne (multiple brand names) is a calcium channel blocker used alone or in combination with other medications to control hypertension. According to the FAA, these medications would not necessarily be considered hazards; however, they must be disclosed and an appropriate hypertension workup submitted to the FAA. The pilot did not declare any medications on his latest FAA medical certificate application.

Administrative Information

Investigator In Charge (IIC):	Hicks, Ralph
Additional Participating Persons:	David Hays; FAA/FSDO; Memphis, TN Jan Smith; Textron Aviation; Wichita, KS Kurt Gibson; Continental Motors; Mobile, AL
Original Publish Date:	June 22, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89960