Aviation Investigation Final Report

Location:	El Reno, Oklahoma	**Accident Number:**	CEN18FA201
Date & Time:	May 30, 2018, 21:18 UTC	**Registration:**	N2249B
Aircraft:	AYRES CORPORATION S2R	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The commercial pilot was performing an aerial application flight when the airplane impacted radio tower guy wires about 125 ft above ground level. The wreckage path consisted of broken guy wires with yellow paint transfer consistent with the paint on the lower section of the airplane. Examination of the airframe and engine revealed no mechanical anomalies that would have precluded normal operation, and autopsy and toxicology of the pilot did not reveal any evidence of physiological impairment or incapacitation.

The radio tower was depicted on the map that the pilot had with him for spraying operations, and the pilot's son stated that the pilot had flown aerial application flights over the field for several years. Witnesses to the accident stated the airplane was flying normally before it impacted the guy wires, nosed up, and immediately descend to the ground. Although aware of the tower, the pilot did not maintain sufficient clearance from the guy wires while spraying the field, which resulted in the in-flight collision with the wires.

Probable Cause and Findings

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

The pilot's failure to maintain clearance from tower guy wires while maneuvering during an aerial application flight.

Findings

Personnel issues	Decision making/judgment - Pilot
Environmental issues	Wire - Effect on operation

Factual Information

History of Flight

Maneuvering-low-alt flying	Collision with terr/obj (non-CFIT)
Maneuvering-low-alt flying	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On May 30, 2018, about 1710 central daylight time, an Ayres Corporation S2R-T34 airplane, N2249B, impacted guy wires and terrain near El Reno, Oklahoma. The commercial pilot was fatally injured, and the airplane was destroyed by postimpact fire. The airplane was registered to Ag Aviation Equipment LLC and operated by Andy Deterding Ag Aviation as a Title 14 *Code of Federal Regulations* Part 137 aerial application flight. Day visual meteorological conditions prevailed in the area, and no flight plan was filed for the flight, which originated at Medford Municipal Airport (O53), Medford, Oklahoma, about 1600.

Two witnesses stated that, just after 1700, they heard an airplane flying low over their house. They stepped outside to watch the airplane fly over the field about 1/2 mile to the north. One of the witnesses noticed the airplane make a tight turn, as if the pilot was attempting to avoid the radio tower guy wire, and it appeared that the pilot "was pulling up." He then saw the airplane's nose pitch up and immediately "go towards the ground."

According to the pilot's son, who was the operator's chief pilot, the pilot began flying in the late morning, between 0900 and 0930, on the day of the accident. The pilot took a 1-hour break for lunch about 1300 and continued to fly after lunch. The pilot departed to fly his last load to El Reno about 1600. The airplane had a full fuel load, so the flight had a "light load" of chemical. The tower was depicted on the map of the field the pilot had with him for spraying operations, and the pilot's son stated the pilot had flown aerial application flights over that field for several years. The pilot was expected to return to a grass strip in Carrier, Oklahoma, to reload if time permitted. Usually, the pilot would fly until about 1900, approximately 2 hours before dark, before ending flights for the day; it was typical for the pilot to fly all day.

Pilot Information

Certificate:	Commercial	**Age:**	57,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
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:**	March 5, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1500 hours (Total, all aircraft)		

The pilot held a commercial pilot certificate with an airplane single-engine land rating. According to information provided on his most recent Federal Aviation Administration (FAA) second-class medical certificate application, as of March 5, 2018, the pilot had about 1,500 total hours of flight experience, with 250 hours in the previous 6 months. The medical certificate was issued with a limitation for corrective lenses.

Aircraft and Owner/Operator Information

Aircraft Make:	AYRES CORPORATION	**Registration:**	N2249B
Model/Series:	S2R T34	**Aircraft Category:**	Airplane
Year of Manufacture:	1997	**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	T34-223
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Turbo prop
Airframe Total Time:		**Engine Manufacturer:**	Pratt & Whitney
ELT:		**Engine Model/Series:**	PT6A-34AG
Registered Owner:		**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	Agricultural aircraft (137)
Operator Does Business As:		**Operator Designator Code:**	TDIG

The yellow, single-seat, low-wing, fixed-gear airplane was manufactured in 1997 and was designed for aerial agricultural application. It was powered by a Pratt and Whitney model PT6A-34AG turboprop engine, serial number PH1063, and equipped with an Hartzell HC-B3TN-3D/T10282N+4 four-bladed propeller.

The most recent annual inspection was completed on April 3, 2018, at 6,843.4 hours total airframe time. The engine was installed as factory new on April 3, 2018, with 0 time at installation. Maintenance records indicated a final inspection and engine run were completed on the engine before returning the airplane to service after completion of the annual inspection.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KRCE,1355 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	21:15 Local	**Direction from Accident Site:**	160°
Lowest Cloud Condition:	Few / 5500 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	140°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.7 inches Hg	**Temperature/Dew Point:**	35°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Medford, OK (O53)	**Type of Flight Plan Filed:**	None
Destination:	Carrier, OK (OK71)	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	

The 1555 recorded weather observation at Clarence E. Page Municipal Airport (RCE),Oklahoma City, Oklahoma, located 8 miles south-southeast of the accident site, included wind from 140º at 12 kts, 10 miles visibility, few clouds at 5,500 ft, temperature 35ºC, dew point 21ºC; barometric altimeter 29.70 inches of mercury.

The National Oceanic and Atmospheric Administration solar position calculator indicated that, at 1710, the position of the sun in Oklahoma City, Oklahoma, was at an altitude of 40.07º and an azimuth of 269.89º. The airplane was flying from west to east at the time of the accident.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	Unknown
Total Injuries:	1 Fatal	**Latitude, Longitude:**	35.611667,-97.873336(est)

The airplane impacted the ground about 200 feet east of the wires at the edge of a ravine and came to rest inverted. The nose section, fuselage, empennage, and landing gear were consumed by postcrash fire. About 1 ft of the outboard section of a propeller blade was missing and was found in the field north of

the main wreckage. A piece of the lower section of cowling and adjoining air scoop displayed damage consistent with impacting the guy wire. Both pieces were detached from the remainder of the wreckage and were lying in the field, closest to the fallen guy wires.

About 25% of the outboard section of the left wing was not fire damaged and exhibited impact damage with significant leading edge and wingtip crushing along the wingspan. The right wing exhibited thermal damage to about half of the inboard section with significant leading edge crushing along the wingspan. Flight control continuity was established from all flight control surfaces to the cockpit area. Continuity to the control stick could not be verified due to the extensive thermal damage to the cockpit.

The propeller assembly and the engine were impact separated from the airplane. The propeller blades displayed varying degrees of bending, one fractured tip, and impact damage. The exhaust duct displayed compression bending due to contact with guy wires and impact with terrain. The exhaust duct also displayed some evidence of torsional bending. The exhaust stacks were bent and distorted. The left stack was impact separated from the exhaust duct. The gas generator case was bent and distorted. The engine was separated at the "C" flange to expose the hot section components. The downstream face of the compressor turbine disc and blades exhibited rotational scoring from contact with its respective adjacent static components. The upstream face of the compressor turbine blades exhibited scoring from contact with the compressor turbine vane. The power turbine vane baffle was separated from the power turbine vane. The baffle exhibited rubbing on both sides from contact with the power turbine and compressor turbine discs and blades. The power turbine disc and blades exhibited rotational scoring on the upstream face. Several blades were fractured. The oil filter cover was removed. Dark and partially burnt oil was evident adjacent to the filter. The end cap of the filter was removed during the attempted removal of the filter. The reduction gearbox magnetic chip detector was thermally damaged from the post-impact fire, which melted the rubber material covering the magnetic poles. The inlet screen was sectioned to view the first stage compressor blades through the inlet case struts. The visible first stage compressor blades were coated with soot from the post-impact fire. The visible blades did not exhibit any impact damage.

The propeller blade bending, rotational scoring on the compressor turbine disc/blades, and the rotational scoring on the power turbine disc/blades was consistent with the engine producing power at the time of impact.

The top and middle guy wires displayed yellow paint transfers at about the 155-ft mark on the wire, as measured from the ground attachment point toward the tower attachment. Based on the location of paint transfer on the top wire and the attachment height of the wire to the tower, the airplane's estimated altitude at the time of the wire strike was about 125 ft above ground level.

Medical and Pathological Information

The State of Oklahoma, Office of the Chief Medical Examiner, Oklahoma City, Oklahoma, performed an autopsy of the pilot. The cause of death was multiple blunt force injuries. The autopsy revealed an enlarged heart and severe atherosclerotic disease of one coronary artery with greater than 80% narrowing of the proximal right coronary artery. There was mild to moderate disease of the left anterior descending coronary artery, and a poorly defined area of myocardial fibrosis on the left ventricular free wall. No other significant natural disease was identified.

Toxicology testing performed by the FAA's Forensic Sciences Laboratory identified ibuprofen in urine; verapamil in blood and urine; norverapamil in blood and urine; and rosuvastatin in urine.

Verapamil (of which norverapamil is a metabolite) is used to treat high blood pressure. Rosuvastatin is a prescription medication used to reduce blood cholesterol and triglycerides levels. Neither medication is considered to pose a hazard to flight safety.

Administrative Information

Investigator In Charge (IIC):	Liedler, Courtney
Additional Participating Persons:	James Wirt; FAA; Oklahoma City, OK
Original Publish Date:	April 13, 2020
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97362

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available here.