



Aviation Investigation Final Report

Location:	Harlingen, Texas	Accident Number:	CEN19FA117
Date & Time:	April 9, 2019, 10:33 Local	Registration:	N7314D
Aircraft:	Air Tractor AT 502	Aircraft Damage:	Destroyed
Defining Event:	Low altitude operation/event	Injuries:	1 Fatal
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot was conducting an agricultural flight when witnesses observed the airplane flying at a low altitude before it collided with power transmission lines and terrain. The airplane was destroyed during a postimpact fire. Examination of the airplane wreckage did not reveal any preimpact mechanical malfunctions or failures that would have precluded normal operation.

Toxicology testing detected the sedating antihistamine diphenhydramine in the pilot's blood. Considering that postmortem redistribution of diphenhydramine may result in central levels being two-to-three times higher than peripheral levels, the circulating level was likely in the therapeutic range at the time of the accident. Given the pilot's years of experience and familiarity with the agricultural airplane, it is reasonable to consider diminished reaction times and flying performance attributable to the use of sedating medication 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 failure to maintain clearance from power transmission lines during low altitude flight operations. Contributing to the accident was the pilot's impairment due to a sedating medication.

Findings

Environmental issues	Wire - Effect on equipment
Personnel issues	Monitoring environment - Pilot
Personnel issues	OTC medication - Pilot

Factual Information

History of Flight

Maneuvering-low-alt flying	Low altitude operation/event (Defining event)
Maneuvering-low-alt flying	Collision with terr/obj (non-CFIT)
Post-impact	Fire/smoke (post-impact)

On April 9, 2019, about 1033 central daylight time, an Air Tractor AT-502 airplane, N7314D, was destroyed when it was involved in an accident near Harlingen, Texas. The commercial pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 137 agricultural flight without a flight plan.

The purpose of the flight was to spray pesticide over a cultivated cotton field. There were multiple witnesses who saw the low-flying airplane collide with power transmission lines as it descended into the field to be sprayed. One individual saw the airplane flying east before it made a “sharp right turn” back toward the west and the field to be sprayed. The airplane pitched down and flew over the highway from east-to-west at a low altitude. The airplane then collided with power transmission lines and exploded when it hit the ground.

Pilot Information

Certificate:	Commercial	Age:	77, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Center
Other Aircraft Rating(s):	None	Restraint Used:	4-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:	March 27, 2019
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	March 24, 2016
Flight Time:	(Estimated) 27400 hours (Total, all aircraft), 7500 hours (Total, this make and model)		

The pilot's flight history was established using his logbook. He began flying agricultural operations in April 1965, and his first flight in an Air Tractor AT-502 airplane was in September 1987. He logged at least 7,500 flight hours in the accident airplane. The final

logbook entry was for a flight review dated March 24, 2016, at which time he had logged about 27,400 total flight hours.

Aircraft and Owner/Operator Information

Aircraft Make:	Air Tractor	Registration:	N7314D
Model/Series:	AT 502	Aircraft Category:	Airplane
Year of Manufacture:	1987	Amateur Built:	
Airworthiness Certificate:	Restricted (Special)	Serial Number:	502-0003
Landing Gear Type:	Tailwheel	Seats:	1
Date/Type of Last Inspection:	April 1, 2018 Annual	Certified Max Gross Wt.:	8000 lbs
Time Since Last Inspection:		Engines:	1 Turbo prop
Airframe Total Time:	10822.8 Hrs as of last inspection	Engine Manufacturer:	Pratt & Whitney
ELT:	Not installed	Engine Model/Series:	PT6A-15AG
Registered Owner:		Rated Power:	680 Horsepower
Operator:		Operating Certificate(s) Held:	Agricultural aircraft (137)
Operator Does Business As:		Operator Designator Code:	ZBPG

The airplane's hour meter was destroyed during the postimpact fire, which prevented a determination of the airplane's total service time at the time of the accident. A review of the maintenance records found no history of unresolved airworthiness issues. The operator reported that the airplane departed with 170 gallons of Jet-A fuel and 75 gallons of Malathion pesticide.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	HRL,36 ft msl	Distance from Accident Site:	8 Nautical Miles
Observation Time:	10:52 Local	Direction from Accident Site:	126°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	15 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	190°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	29.97 inches Hg	Temperature/Dew Point:	28°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Raymondville, TX (PVT)	Type of Flight Plan Filed:	None
Destination:	Raymondville, TX (PVT)	Type of Clearance:	None
Departure Time:	10:05 Local	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:		Aircraft Fire:	On-ground
Ground Injuries:		Aircraft Explosion:	On-ground
Total Injuries:	1 Fatal	Latitude, Longitude:	26.292499,-97.764999

The accident site was in the cotton field that the pilot intended to spray. The airplane impacted two 1.108-inch diameter, 345-kilovolt power transmission cables strung between two 136 ft tall structures along the eastern border of the field. The airplane subsequently impacted the field about 200 ft west of the powerlines (Figure 1). A fan-shaped wreckage debris field extended about 100 ft from the initial ground impact. The overall distribution of the wreckage was consistent with the airplane traveling west-northwest when it impacted the ground. Red navigation lens material from the left wingtip was found at the initial impact with the ground.

The main wreckage consisted of the fuselage, empennage, right wing, engine, and propeller. The main wreckage exhibited evidence of a prolonged postimpact ground fire. The fuselage was found upright with significant fire damage. All airframe structural components and flight control surfaces were identified at the accident site. Flight control continuity could not be established due to damage; however, all observed separations were consistent with overstress or damage sustained during the postimpact fire. The left wing was highly fragmented during impact. There were two transmission cables conjoined with the main wreckage; one wrapped

around the engine and propeller shaft, and the other wrapped around the wing carry-through structure, right wing, and fuselage (Figure 2 and Figure 3). The forward face of the left main wing spar exhibited broad vertical marks 3-6 ft from the airplane centerline that were consistent with contact with a large diameter power transmission cable (Figure 3). The right wing was largely intact with fire damage to the inboard portion of the wing.



Figure 1. Main Wreckage and Impact Debris Path



Figure 2 – Power Transmission Cables Conjoined with Main Wreckage (red arrows point to cables)



Figure 3 – Power Transmission Cables Conjoined with Right Wing (Left Image) and Cable Impact Marks to the Forward Face of the Left Main Wing Spar (Right Image)

Engine control continuity could not be established due to impact and fire damage. The first-stage compressor blades exhibited a tip rub and ingested dirt and organic matter. The engine was separated at the C flange to review the turbine section. The downstream side of the compressor turbine disc and blades exhibited rotational scoring from contact with the power turbine vane and baffle. A majority of the power turbine blades had separated from the disc. Several power turbine blade roots and tips were found preceding the main wreckage in the debris field. The remaining turbine blades were displaced forward in the disc and were fractured close to midspan of the airfoil. The disc and blades exhibited rotational scoring on the upstream side from contact with the power turbine baffle and vane. The downstream side of the power turbine blades and disc exhibited rotational scoring from contact with the exhaust duct.

The propeller remained attached to the engine. The three propeller blades remained attached to the hub and exhibited spanwise twisting. Two blades segmented during the impact sequence and one blade remained intact with leading and trailing edge gouging near the blade tip. The intact blade also exhibited minor chordwise scratches about midspan.

The postaccident examination did not reveal any anomalies that would have precluded normal operation of the airplane before it collided with the high-voltage power transmission lines.

Medical and Pathological Information

An autopsy of the pilot was performed by the Cameron County Forensic Department, Harlingen, Texas, which identified the cause of death as blunt force trauma. No significant natural disease was identified during the autopsy. Toxicological testing, completed by the Federal Aviation Administration's Forensic Sciences Laboratory, identified 0.605 µg/mL of diphenhydramine in blood and detected diphenhydramine liver samples. No carboxyhemoglobin or ethanol was detected in blood samples. Diphenhydramine is a sedating antihistamine (commonly marketed as Benadryl) and is available over the counter in many products commonly used to treat colds, allergies, and insomnia. The therapeutic range is 0.025 to 0.100 µg/mL and it has a half-life of 3 to 14 hours. Diphenhydramine undergoes postmortem distribution and central levels may be two-to-three times higher than peripheral levels.

Administrative Information

Investigator In Charge (IIC):	Fox, Andrew	
Additional Participating Persons:	Robert Thomason; Federal Aviation Administration - San Antonio; San Antonio, TX Kyle Schroeder; Air Tractor; Olney, TX Jeff R Davis; Pratt & Whitney Canada; Bridgeport, WV Beverley Harvey; Transportation Safety Board of Canada	
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Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99235	

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