Aviation Investigation Final Report

Location:	JENNINGS, Louisiana	**Accident Number:**	FTW96GA365
Date & Time:	August 30, 1996, 23:23 Local	**Registration:**	N14196
Aircraft:	Piper PA-23-250	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Public aircraft		

Analysis

During a night aerial application flight, the multiengine airplane impacted trees bordering a bayou/swamp area. The airplane was flown by a single pilot accompanied by a crew member to operate the spraying equipment. Company personnel stated that the crew member never flew the airplane. Two other pilots observed patchy fog forming along the ground and around the wooded bayou areas and returned to the airport. Local authorities stated that 'fog often forms up like a cloud out of the woods and spreads at tree height' during the night hours. The pilot's total flight time in the PA-23 airplane was 75 hrs (9.0 hrs in the previous 3 years). Marginal VFR weather with mist & thunderstorms was forecast. Airmet Sierra was valid for ceilings below 1,000 feet AGL with visibility below 3 miles with precipitation and mist. Area stations reported a temperature/dewpoint spread of one degree or less and the radiosonde data indicated a temperature/dewpoint spread of 4 degrees or less from the surface to 5,407 feet MSL. Terminal forecast winds were 5 knots or less. The average relative humidity was 90% with precipitable water at 139%.

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. Factors were the pilot's lack of recent experience in the make and model of airplane, the dark night, and fog.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: MANEUVERING - AERIAL APPLICATION

Findings
1. OBJECT - TREE(S)
2. (C) ALTITUDE/CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND
3. (F) LACK OF RECENT EXPERIENCE IN KIND OF AIRCRAFT - PILOT IN COMMAND
4. (F) LIGHT CONDITION - DARK NIGHT
5. (F) WEATHER CONDITION - FOG

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT:

On August 30, 1996, at 2323 central daylight time, a Piper PA-23-250, N14196, registered to and operated as a public use aircraft by the Jefferson Davis Parish Mosquito Abatement District No. 1, impacted trees while maneuvering near Jennings, Louisiana. The commercial pilot and another crew member were fatally injured and the airplane was destroyed. Dark night visual meteorological conditions prevailed for the local aerial application flight and a company VFR flight plan was filed. The flight originated at 2140.

During interviews, conducted by the investigator-in-charge, and on the enclosed statements, company pilots reported the following information. Rain showers occurred from 1800 through 2040 in the evening; however, at the time the flights departed the airport, the visibility was 10 to 15 miles with a ceiling at 1,400 feet AGL to 1,500 feet AGL. All of the flights operated with a single pilot except the multiengine airplane that had a "crew member as an observer to watch the area and to operate the spraying equipment while the pilot flew the airplane." The two single engine airplanes and the multiengine airplane (N14196) departed from runway 31 at the Jennings Airport and each airplane covered a designated area of the city. The pilot of N14196 sprayed his area with east to west swaths and once he had completed those areas, he was spraying the remainder of the load along the eastern edge of the Parish near the Bayou Nepzique.

During the flights, the two pilots of the single engine airplanes communicated via their aircraft radios; however, these pilots did not communicate with the pilot of N14196. One of the pilots reported that "at the end of my flight assignment there was some patchy fog around the wooded bayou areas." As this pilot returned to the airport for landing, he attempted to call N14196; however there was no reply even though he heard the base of operations radio repeater turn on. This single engine airplane landed at 2355. The second single engine airplane landed about 2410 and the pilot taxied the aircraft into the hangar as he "had begun to experience some patchy light ground fog forming in the area." N14196 did not return and the company pilots reported the airplane as missing. Search and rescue were initiated and the airplane was located at 1411 the following evening in the swamps adjacent to the Bayou Nepzique. Local authorities reported that the search was hampered by fog and that "fog often forms up like a cloud out of the woods and spreads at tree height" during the night hours. They further stated that the accident location was in a dark area of the swamps.

Bayou Nepzique marks the eastern boundary of the Jefferson Davis Parish and the western boundary of the Acadia Parish. The airplane was located in the swampy area along the east bank of the bayou inside the Acadia Parish. Interstate 10 (I-10) runs east and west across the bayou.

The driver of a vehicle, traveling west on I-10 at 2310 observed "the sky conditions to be high thin scattered clouds and at least 10 miles visibility in the area of Jennings." A witness, driving his vehicle east on I-10, reported observing an "airplane heading north and banked a little to the N-W [northwest] just over the Bayou Nezpique, and his running lights went out of sight, just over the trees [and] the time was between 11:15 & 11:30 PM [CDT]." Another witness who was riding in the vehicle recalled the driver saying "look at that plane it looks like it [is] going to land, there is no airport there." Then the witnesses "saw no[th]ing." A witness who lives in a residence at the approach end of runway 31 stated that she "noticed or heard that the engine or engines had a fluttering sound instead of the smooth sound that engine[s] produce." This witness further stated that the airplane "could have landed at the airport."

PERSONNEL INFORMATION:

The operator reported (NTSB Form 6120.1/2) the pilot's total time in this make and model (PA-23) airplane as 75 hours. Company records indicated that the pilot had flown the PA-23 for 3.7 hours in 1994, 1.9 hours in 1995, and 3.4 hours in 1996. Pilot logbooks were not made available to the Board. Company insurance records (copy enclosed) stated that the pilot had been involved in aerial application operations for 12+ years.

During interviews, conducted by the investigator-in-charge, company pilots stated the following information. The aircraft was certificated by the FAA for single pilot operations; however, the right seat person (Director of the Jefferson Davis Mosquito Abatement District) was considered a crew member by the company. The crew member would go along during the multiengine aerial application flights and operate the spraying equipment while the pilot flew the airplane. This crew member had flown an "estimated 1,000 hours during aerial application flights; however, he neither held nor was required to hold a pilot certificate and he never flew the airplane."

AIRCRAFT INFORMATION:

The Jefferson Davis Parish Mosquito Abatement District sent a letter dated March 1, 1988, to the FAA Flight Standards District Office at Baton Rouge, Louisiana, informing the FAA that the district would be operating N14196, Serial #27-4758, as a public aircraft. The standard airworthines certificate (FAA Form 8100.1) was returned to the FAA at that time.

The maintenance records were reviewed by the investigator-in-charge. Aircraft records indicated that an altimeter test as per FAR 91.411 was performed on January 18, 1991. Engine, serial #L-4027-48, was overhauled in February 1990 and reinstalled in the left position on N14196. Engine, serial #L-956-48, was disassembled, a crankcase crack repaired, tested, returned to service and installed in the right position on N14196 in May 1994. The last annual inspection was completed on May 20, 1996. Both propellers were overhauled, found airworthy, and returned to service on May 16, 1996.

Installed under the fuselage of the aircraft between station 91.50 and station 123.75 was a chemical resistant steel cage tank with an attached 8 foot spray boom. The chemical tank was held in place by 8 steel turn buckles each rated at 3,200 pounds. Installed in the center of the spray tank was a manually operated dump assembly with a cable running from the dump door through the inside of the aircraft to a handle positioned between the cockpit seats.

METEOROLOGICAL INFORMATION:

Weather reports were reviewed by the investigator-in-charge. The satellite photograph (enclosed) taken at 2303 indicated moisture covered portions of Southern Louisiana. The area forecast outlook for Louisiana included marginal VFR weather with mist and thunderstorms across the southern third of the state. Airmet Sierra was valid at the time of the accident for ceilings below 1,000 feet AGL with visibility below 3 miles with precipitation and mist developing over portions of the state.

The nearest local reporting stations to the Jennings Airport and the accident site (N 30 degrees 16 minutes 01.3 seconds; W 92 degrees 37 minutes 29.4 seconds) were Lake Charles, Louisiana, and Lafayette, Louisiana. Both stations reported a temperature/dewpoint spread of one degree or less throughout the time of the aerial application flight and the accident. Radiosonde (release time 2309) data indicated a temperature/dewpoint spread of 4 degrees or less from the surface to 5,407 feet MSL. Terminal forecast winds for Southern Louisiana were 5 knots or less.

The average relative humidity chart (surface to 500 millibars/hectoPascals; 18,000 feet MSL) indicated 90 percent across Southern Louisiana. The precipitable water panel indicated that 2.12 inches of precipitable water was present and that amount is 139 percent of normal (above normal) for any day during the month.

WRECKAGE AND IMPACT INFORMATION:

The wreckage was distributed along a measured magnetic heading of 140 degrees with the final resting site at 130 feet from the east bank of the Nepizque Bayou in a heavily wooded swampy area. The fuselage came to rest in a nose low attitude on a measured magnetic heading of 118 degrees. Trees along the edge of the bayou were estimated at 70 to 80 feet in height with one of the trees broken and lying on the ground. Fifty-nine feet from the edge of the bayou, into the swampy area, there were three trees with their top branches broken away with portions of the right wing in and near the base of these trees. See the enclosed wreckage diagram for additional details.

The right wing separated from the fuselage outboard of the engine nacelle. The right wing was found in several pieces with the flap and aileron separated from the wing structure. The right aileron balance weight was not located. The integrity of the right wing fuel cells was compromised. Portions of the right wing leading edge and the leading edge of the aileron were crushed aft. Diameter measurements of the crushed areas were close to the size of the tree

branches.

The left wing was separated outboard of the engine nacelle with the wing skin fragmented into several pieces. The aileron, with the balance weight in place, was found wedged between two tree branches projecting from the swamp. The flap was bent and cracked at mid-span having separated at the outboard and center attachment points.

The forward fuselage and the cockpit panel/instruments including the altimeter were destroyed. The left control column was intact at the instrument panel and the right control column was separated at the instrument panel. The nose landing gear was separated from the airframe and the main gears were found in the extended position. Portions of the aft fuselage remained intact and a spray tank with an electrically driven pump and associated tubing was suspended from the underside of the fuselage. The vertical and horizontal stabilizers remained intact and displayed crushing and bending. The left horizontal stabilator trim tab was attached but its trim control rod was separated; whereas, the right horizontal stabilator trim tab with its control rod was secure. The upper portion of the rudder and the balance weight were separated from the empennage.

The left engine (serial #L-4027-48) was found separated from the airframe and submerged in an inverted position with the propeller (Hartzell HC-E2YR-2RBSF) attached. One propeller blade, separated from the hub, was not recovered and the other propeller blade was broken off at the midpoint with the outboard portion not recovered. The right magneto, the fuel pump, the oil sump, ignition harness, and the exhaust system were destroyed and the cylinders exhibited damage. The fuel injector, the starter, alternator, oil filter, and vacuum pump were separated from the engine and not recovered. The crankcase was fractured and the camshaft was bent.

The right engine (serial #L-956-48) was found separated from the airframe and submerged in an upright position with the propeller separated at the crankshaft propeller flange consistent with torsional separation. Both propeller blades displayed chordwise scoring and bending. One of the blades that was loose in the hub exhibited longitudinal twisting and the other propeller blade exhibiting torsional twisting. The right magneto and the oil sump were destroyed and the cylinders exhibited damage. The fuel injector, engine driven fuel pump, starter, alternator, vacuum pump, and oil filter were separated from the engine and not recovered.

MEDICAL AND PATHOLOGICAL INFORMATION:

Autopsies were performed by the Calcasieu Parish Coroner's office and Forensic Facility at Lake Charles, Louisiana. Toxicological testing for the pilot was performed by the FAA Civil Aeromedical institute (CAMI) at Oklahoma City, Oklahoma. The toxicology findings were negative.

TEST AND RESEARCH:

The airplane was examined in October 1996 at Lancaster, Texas, under the surveillance of the investigator-in-charge. Aileron control continuity was confirmed from the cockpit to the ailerons and from the aft cabin area to both the stabilator and rudder attachment fittings. The upper attachment fitting of the main gear had pulled loose downward from the mounting bolt and the lower portion of the left landing gear strut was bent. The electric fuel boost pumps were bench tested and found operational. According to the manufacturer representative the flap actuator extension of 24 inches indicated the flaps were in the retracted position. During interviews, conducted by the investigator-in-charge, company personnel reported that the "pilot would have the flaps and gear in the retracted position during the spraying and at 2 1/2 miles [approximate site distance] from the airport."

The left fuel selector lever was pulled out of the retaining channel with the channel bent near the outboard (main) tank position. The right fuel selector was found in the outboard (main) tank position.

The left front seat belt was found with the shoulder harness attached; however, the buckle portion of the seat belt was not recovered. The right front seat belt had been cut during the recovery process and the shoulder harness remained secured to the fuselage structure.

No evidence of arcing was found during the examination of the electrical system. In October 1996 at Lancaster, Texas, continuity testing, utilizing an Ohm meter, was positive for the light bulbs (nose gear down, empennage navigation light, post lights (3), wing mounted flood light, and (2) cockpit overhead lights). Light bulbs for the cockpit post lights (3), cockpit overhead lights (2), gear indicator lights (4), an empennage navigation light, and the annunciator panel lights were forwarded to the NTSB Metallurgical Laboratory for examination of their filaments.

The NTSB metallurgist stated on the enclosed report that evidence of filament stretching was revealed on two of the panel light bulbs. During interviews, conducted by the investigator-in-charge, company personnel stated that the aerial application flights were conducted using the panel post lights for cockpit illumination.

The rudder trim displayed 4 1/2 to 5 threads which indicated a neutral position according to the manufacturer representative.

Examination of the left engine (serial #L-4027-48) and its accessories revealed the following information. The left and right magneto would not produce spark initially; however, after the removal of mud and water, each magneto produced spark at all 6 posts. The fuel flow divider was disassembled and the fuel diaphragm was intact. All the spark plugs contained mud and water and when tested at 105 psi the top spark plug for cylinder #1, and the bottom spark plugs for cylinder #2 and #3 did not fire. The crankshaft would not rotate and all the cylinders except #1 were removed and disassembled. The oil pump gears were intact and rotated. The engine teardown and accessory examination did not reveal any pre-existing discrepancies.

Examination of the right engine (serial #L-956-48) and its accessories revealed the following information. After water and mud was removed, the left magneto produced spark at all 6 posts and 2 of the 6 posts on the right magneto produced spark. When the spark plugs were tested at a pressure of 105 psi, the top spark plugs for cylinders #2, #3, #5, and the bottom spark plugs for cylinders #1, #3, #4, #5 produced a spark. The top spark plug for cylinder #4 was not recovered and the bottom spark plugs for cylinders #2 and #6 did not spark. The engine was rotated and continuity was found with cylinders #1, #3, #5, and #6 producing compression. The push rods for cylinder s #2 and #4 were bent and compression was not produced by these cylinders. Continuity to the accessory gears and the valves was confirmed. The engine teardown and accessory examination did not reveal any pre-existing discrepancies.

The propellers were examined (enclosed report) in October 1996 at Lancaster, Texas. The left propeller spinner was crushed and deformed in a rearward direction. The propeller piston had a piece of "wood-like material jammed in the front" of the piston and the L2 blade was separated from the hub. Physical evidence on the L1 blade preload plates indicated that "the plate had shifted towards the high pitch direction during the impact sequence." The outboard tip of the L1 blade was "twisted off towards the high pitch direction." The tip of the L1 blade and the L2 blade were not recovered. The right propeller was found separated from the engine and the "fracture surfaces displayed nearly full circle 45 degree shear lips." The blades were bent rearward and twisted. The manufacturer representative reported that the examination supports that both propellers were rotating and developing some power at impact. No pre-impact discrepancies were noted which would have precluded normal propeller operation. Oil dumped from the propeller governors during the bench check.

The fractured portion of the left propeller blade (L1) was examined at the NTSB Metallurgical Laboratory. The metallurgist reported that examination of the propeller blade fracture revealed "fractures typical of an overstress separation." He further stated that "no evidence of a preexisting fracture was noted."

ADDITIONAL DATA:

The airplane was released to the owner's representative.

Pilot Information

Certificate:	Commercial	**Age:**	58,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):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	May 6, 1996
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	3982 hours (Total, all aircraft), 75 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N14196
Model/Series:	PA-23-250 PA-23-250	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:		**Serial Number:**	27-4758
Landing Gear Type:	Retractable - Tricycle	**Seats:**	3
Date/Type of Last Inspection:	May 20, 1995 Annual	**Certified Max Gross Wt.:**	5200 lbs
Time Since Last Inspection:	25 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:		**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-540-C4B5
Registered Owner:	JEFFERSON DAVIS PARISH	**Rated Power:**	250 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night/dark
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Unknown	**Visibility**	5 miles
Lowest Ceiling:	Broken / 1400 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/ None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	23°C / 22°C
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	(3R7)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	
Departure Time:	21:40 Local	**Type of Airspace:**	Class E

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	30.220329,-92.64994(est)

Administrative Information

Investigator In Charge (IIC):	Smith, Joyce
Additional Participating Persons:	JAY RODRIQUEZ; BATON ROUGE , LA
Original Publish Date:	August 25, 1997
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=19665