Aviation Investigation Final Report

Location:	MORTON, Texas	**Accident Number:**	FTW98FA012
Date & Time:	October 14, 1997, 09:47 Local	**Registration:**	N731GY
Aircraft:	Cessna A188B	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The airplane impacted power lines and the ground during a local aerial application flight. The flagger reported that the airplane had been spraying 'Roundup' defoliant on a cotton field east of the mishap site, using north-to-south-to-north passes. The airplane struck and severed the three top pole-mounted aluminum electrical cables spanning east to west at an approximately height of 35 feet above the ground. Physical evidence at the accident site indicates that the airplane impacted the ground on a measured heading of 176 degrees in a nose low attitude while in a slight right turn. Teardown examination of the engine and propeller were performed, and no defects were found that that would have prevented normal operation of the airplane. The pilot had been hired by the owner/operator approximately 2 weeks prior to the accident after the operator became ill.

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 the power lines while maneuvering during an aerial application flight.

Findings

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

Findings

1. OBJECT - WIRE,TRANSMISSION
2. (C) CLEARANCE - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: DESCENT - UNCONTROLLED

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Factual Information

HISTORY OF FLIGHT

On October 14, 1997, at 0947 central daylight time, a Cessna A188B agricultural airplane, N731GY, was destroyed upon impact with power lines and subsequent impact with terrain while maneuvering near Morton, Texas. The non-instrument rated commercial pilot, sole occupant of the airplane, was fatally injured. The restricted category airplane was owned and operated by Cunningham Crop Care Inc., of Morton, Texas, under Title 14 CFR Part 137. Visual meteorological conditions prevailed for the local aerial application flight for which a flight plan was not filed. The airplane departed from the Cochran County Airport (F85), near Morton, Texas, approximately 30 minutes prior to the accident.

In a telephone interview, the operator told the investigator-in charge (IIC) that the spray-equipped agricultural airplane had been spraying "Roundup" defoliant (non-toxic) on a 170 acre cotton field east of the mishap site, using north-to-south-to-north passes. The flagger reported to the FAA inspector that because of a wire-pole line along the western border of the field, the pilot was to make one additional "clean up" pass just to the west of the pole line, utilizing the prevailing westerly wind to drift the chemical to cover any voids along the western edge of the treated field.

The airplane struck a power line that runs in an east-to-west direction, "teeing" into the power line bordering the cotton field at the northwest corner of the field. The airplane severed three of the four pole-mounted aluminum electrical cables at an approximately height of 35 feet off the ground. The aluminum lines were unmarked and appeared light gray in color. The unmarked wooden poles supporting the wires were described as "very dark brown."

The flagger did not witness the accident. The pilot had radioed the flagger and instructed him to depart for the next field while he executed one additional pass over the edge of the field. When the airplane failed to arrive for fuel and reloading at its home base field, a search was begun.

The wreckage of the airplane was found by the flagger on a dirt access road located to the west of the field being sprayed. The coordinates for the accident site were reported as West 102 degrees 41 minutes, North 33 degrees 43 minutes. The accident site, which was reported to be at estimated altitude of 3,747 feet MSL, was surrounded by open cultivated fields on all quadrants.

There were no reported eyewitnesses to this accident.

PERSONNEL INFORMATION

The commercial pilot was hired by the owner/operator of the airplane approximately 3 weeks prior to the accident after the operator became ill and had to undergo treatment. The pilot completed his last physical examination on November 22, 1996, and was issued a second class medical certificate in accordance with special issuance provisions of FAR 67.19. His medical certificate was issued with a waiver requiring the pilot to wear eye glasses for near vision.

The 59 year old pilot was issued a commercial pilot certificate on January 21, 1976, and according to his last flight physical, he had accumulated a total of 7,500 hours of flight. Documents submitted to the insurance prior to the accident stated that the pilot had accumulated a total of 6,690 hours in agricultural airplanes, of which 75 hours were in the Cessna 188. The operator reported that the accident occurred during the pilot's first mission of the day while delivering the third load on the same field.

AIRCRAFT INFORMATION

The 1977 model "Ag Wagon" was manufactured by Cessna Aircraft on March 7, 1977, and assigned serial number 188-02896T. The airplane was equipped with a 285 gallon hopper. The restricted category airplane was equipped with a Continental IO-520-D(26) engine, serial number 559990. The engine had accumulated a total of 1,733.5 hours since its last major overhaul. The engine was driving a McCaulley 2-bladed constant speed propeller, model number D2A34C98-NO, serial number 724749.

The last annual inspection on the airplane was completed on February 14, 1997, at 3,488.0 airframe hours. The tachometer and the Hobbs meter were destroyed by the post impact fire.

A relative of the pilot reported that the engine on the accident airplane "lost oil pressure" on the day prior to the accident. Another relative further reported that 6 or 7 days prior to the accident, the pilot executed a precautionary landing in a field 1.2 miles from the operator's airstrip after the airplane's windscreen "got covered with oil."

The operator reported to the IIC that the airplane was loaded with 130 gallons of defoliant, and the left fuel cell was serviced with 25 gallons of 100LL fuel every time they landed to reload. An estimate of the weight of the airplane at the time of the accident placed the airplane within its normal category limits.

A review of the airframe and engine maintenance records by the FAA inspector did not reveal evidence that any uncorrected maintenance defects existed prior to the flight.

METEOROLOGICAL INFORMATION

At 0956, the Lubbock International Airport, located approximately 54 nautical miles east of the accident site, reported clear skies, visibility of 7 statute miles, a temperature of 55 degrees, a

dew point of 34 degrees Fahrenheit, with winds from 200 degrees at 10 knots. Additional sequence reports for the Clovis Municipal Airport (CVN) and Cannon AFB (CVS), both near Clovis, New Mexico, located approximately 45 nautical miles west of the accident site, are enclosed with this report.

WRECKAGE AND IMPACT INFORMATION

Physical evidence noted by the FAA inspector and representatives from the engine and airframe manufacturers at the accident site indicated that the airplane impacted the ground in a nose low attitude while in a slight right turn on a measured heading of 176 degrees. A detailed examination of the accident site revealed the presence of disturbed ground and a shallow crater approximately 145 feet from the power lines. Portions of components associated with the bottom of the engine and engine cowling were found at the initial point of ground impact.

The airplane came to rest in the inverted position, approximately 77 feet beyond the initial impact crater. The nose of the airplane came to rest pointing towards the impacted power lines. See enclosed wreckage diagram for details of the wreckage distribution.

Three of the four electrical cables on an east-west power line located approximately 145 feet north of the initial point of impact were found severed. The power company that operated the power lines reported that a power interruption occurred at 0947.

A detailed examination of the flap system revealed that the flaps were in the fully retracted position at the time of impact. The right main landing gear was found separated from the airframe. The left main landing gear remained attached to the airframe and sustained fire damage.

The left wing was destroyed by fire in the area of the fuel cell and its attachment to the wing stub. A section of the left wing lift strut was also thermally dissolved about 12 inches from the fuselage stub wing attachment. The leading edge and tip were found to be free of impact damage.

The right wing was observed to be free of fire damage. The root end was attached to the stub wing. The lift strut was found connected at both ends. The outboard leading edge skins, beginning mid-span, were tucked under the wing. The wing tip was found near the crater at the initial point of impact. The leading edge sustained spanwise damage and the wing skin was found to be swept over the upper surface of the wing.

The cockpit area, including engine controls, the hopper tank, and the "on-off" fuel valve were destroyed by fire. The propeller governor, oil cooler, and both magnetos were found separated from the engine. The engine remained attached to the airframe.

The forward portion of the tailcone sustained thermal damage, but was still attached to

fuselage structure. The burned remains of the empennage were found under the main wreckage.

The propeller separated from the engine crankshaft and was found lying at the edge of the crater at the initial point of impact. All 6 mounting studs were found pulled from the hub and both index dowels remained attached to the propeller mounting flange. Both blades were found lose on the hub and were free to rotate. Two transverse slashes were found in the crater at the initial point of impact. The propeller spinner was crushed and only small fragments of the spinner were left attached to the propeller hub. While both propeller blades exhibited similar deformations with about 20 degrees aft-bending beginning mid span of the blades, the number two blade also exhibited a marked forward bend.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy and toxicological tests were ordered and performed. The autopsy was performed by the Lubbock County Medical Examiner's Office in Lubbock Texas, at 0845 on October 15, 1997. Toxicological tests were negative.

FIRE

A post impact fire destroyed the airplane. The source of ignition could not be determined. The fire originated on the left side of the airplane near the root of the wing. The left wing and the fuselage forward of the baggage compartment was consumed by fire. No evidence of pre-impact fire was found during the examination of the wreckage

SURVIVAL ASPECTS

The pilot was wearing a flight helmet. According to law enforcement personnel who responded to the accident site, the pilot was wearing the available seat belts and shoulder harnesses at the time of the impact. All personnel restraint webbing was destroyed by fire and the seat belt buckle was found in the locked (clasped) position.

The airplane was equipped with a cable deflector extending from the top of the windshield to the top of the vertical stabilizer to protect the empennage and tail from wire strikes. Additionally the leading edges of the two main landing gears and the frontal area of the windshield were equipped with cable cutters. Both main landing gear cutter blades displayed small nicks at the first clamp above the wheel axle. The windshield cutter blade was not located.

TEST AND RESEARCH

The engine was examined and a complete teardown inspection performed under the supervision of the IIC on Tuesday, November 4, 1997, at Air Salvage of Dallas in Lancaster, Texas. No discrepancies were found that could have prevented engine operation. See the

enclosed engine report for details of the engine teardown and examination.

The propeller was shipped to the manufacturer's facility in Vandalia, Ohio, for further examination. The propeller was examined on Tuesday, February 17, 1998, under the supervision of the NTSB IIC. No pre-impact defects were found that could have prevented normal operation of the propeller. Internal signatures in the form of marks and impact indentations made by the propeller spring and by the propeller actuating pin revealed that the blades were in the low pitch position at the time of impact. See enclosed report for details of the examination and teardown.

ADDITIONAL DATA

The remains of the wreckage were released to the owner's representative on February 20, 1998, upon completion of the field portion of the investigation.

Pilot Information

Certificate:	Commercial	**Age:**	59,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Center
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	November 22, 1996
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	7500 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N731GY
Model/Series:	A188B A188B	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	18802896T
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	February 14, 1997 Annual	**Certified Max Gross Wt.:**	4200 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3488 Hrs	**Engine Manufacturer:**	Continental
ELT:	Not installed	**Engine Model/Series:**	IO-520-D(26)
Registered Owner:	JIM W. CUNNINGHAM	**Rated Power:**	300 Horsepower
Operator:		**Operating Certificate(s) Held:**	
Operator Does Business As:	CUNNINGHAM CROP CARE	**Operator Designator Code:**	TBEG

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LBB ,3338 ft msl	**Distance from Accident Site:**	48 Nautical Miles
Observation Time:	09:56 Local	**Direction from Accident Site:**	95°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	11°C / 1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(F85)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	09:17 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	33.719684,-102.749099(est)

Administrative Information

Investigator In Charge (IIC):	Casanova, Hector
Additional Participating Persons:	JOHN H BOATRIGHT; LUBBOCK , TX JOHN HUY; WICHITA , KS JOHN T KENT; MOBILE , AL THOMAS M KNOPP; VANDALIA , OH
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Investigation Class:	Class
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