



National Transportation Safety Board Aviation Accident Final Report

Location:	Philadelphia, MS	Accident Number:	ERA09LA128
Date & Time:	01/02/2009, 1200 CST	Registration:	N5013C
Aircraft:	AIR TRACTOR INC AT-602	Aircraft Damage:	Substantial
Defining Event:	VFR encounter with IMC	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

The non-instrument rated pilot departed an estimated 20 minutes in trail behind another pilot flying to the same destination airport, for an intended fuel stop, located approximately 239 nautical miles away. The two pilots exchanged two-way communications using text messaging and the first pilot performed a precautionary landing in a field due to adverse weather. At approximately 1155, the pilot sent a text message to his brother advising him he was on the way home and dodging weather. At approximately 1156, the accident pilot was sent a text message asking about the weather to which he replied he could not see. Witnesses near the area reported hearing a sound and the airplane impacted trees. The airplane impacted trees, then the ground, and was destroyed by impact and the postcrash fire. Inspection of the engine, airframe, and flight controls revealed no evidence of preimpact failure or malfunction.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper preflight weather planning and his continued VFR flight into IMC conditions resulting in an in-flight collision with trees.

Findings

Personnel issues	Weather planning - Pilot (Cause) Decision making/judgment - Pilot (Cause)
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Factual Information

HISTORY OF FLIGHT

On January 2, 2009, about 1200 central standard time, an Air Tractor AT-602, N5013C, registered to and operated by Quinn Aviation, Inc., collided with trees then the ground near Philadelphia, Mississippi. As reported by the pilot, instrument meteorological conditions prevailed at the time and no flight plan was filed for the 14 Code of Federal Regulations (CFR) Part 91 positioning flight from Mac Crenshaw Memorial Airport (PRN), Greenville, Alabama, to Cleveland Municipal Airport (RNV), Cleveland, Mississippi. The airplane was substantially damaged and the certificated commercial pilot, the sole occupant was killed. The flight originated about 1124, from PRN.

There was no contact with any Federal Aviation Administration (FAA) air traffic control (ATC) facility during the accident flight. A pilot who departed the same airport as the accident pilot, and who was en route to the same fuel stop destination, stated that he departed PRN at approximately 1100.

Records obtained by search and rescue personnel indicate that at 1144, the accident pilot sent a text message to the pilot that had departed before him advising that he was 235 statute miles (sm) from Cleveland, Mississippi. At 1147, the accident pilot sent another text message to the pilot advising that he was 200 sm from Cleveland, Mississippi. At 1154, the pilot that departed before the accident pilot sent a text message to the accident pilot advising him that he was going to Meridian, Mississippi. At 1155, the accident pilot sent a text message to his brother that he was on the way home and dodging weather. At 1157, the pilot who had departed before the accident pilot sent a text message to the accident pilot questioning how is the weather, to which the accident pilot replied, "can't see." At 1201, the pilot who had departed before the accident pilot sent a text message to the accident pilot asking how far he was from Cleveland, Mississippi. The accident pilot did not respond. The pilot who had departed before the accident pilot reported to Safety Board personnel that he performed a precautionary landing in a field between Liberty and Moscow, Mississippi. He indicated that adverse weather conditions precluded further flight to the planned destination airport.

A search for the airplane was initiated by Mississippi and Alabama wings of the civil air patrol (CAP) on January 2, 2009, at 2319 and 2324, respectively. The CAP incident commander reported they were only able to fly 2 sorties due to the adverse weather that continued throughout the search process. In addition, a search by several Mississippi law enforcement agencies occurred. The wreckage was located on January 5, 2009, at approximately 1654, by the land owner that the airplane had crashed on.

According to law enforcement personnel, the main wreckage came to rest at the end of an approximately 70 yard ground scar. The airplane was substantially damaged by impact and postcrash fire.

PERSONNEL INFORMATION

The pilot, age 48, held a commercial pilot certificate with airplane single engine land rating issued February 18, 2000, and held a second class medical certificate with no limitations issued March 25, 2008.

The National Transportation Safety Board (NTSB) Pilot/Operator Aircraft Accident/Incident

Report submitted by the operator indicated the pilot's total time was estimated to be 7,500 hours, with 2,500 hours in the accident make and model airplane.

AIRCRAFT INFORMATION

The airplane was manufactured in 1997 by Air Tractor, Inc., as model AT-602, and was designated serial number 602-0428. It was powered by a 1,050 shaft horsepower Pratt & Whitney PT6A-60AG engine and equipped with a constant speed Hartzell propeller.

Review of the maintenance records revealed the airplane was last inspected in accordance with a 100-Hour inspection on November 3, 2008. The airplane total time at that time was listed as 5,700.5 hours.

METEOROLOGICAL INFORMATION

A surface observation weather report taken at Key Field Airport (MEI), Meridian, Mississippi, on the day of the accident at 1058, or approximately 26 minutes before the flight departed indicated the wind was from 170 degrees at 6 knots, the visibility was 10 statute miles, and scattered clouds existed at 1,100 feet. The temperature and dew point were 17 and 13 degrees Celsius, respectively, and the altimeter setting was 30.02 inches of mercury (inHg). The Key Field Airport is located approximately 31 nautical miles and 161 degrees from the crash site location.

A surface observation weather report taken at MEI on the day of the accident at 1158, indicated the wind was from 190 degrees at 3 knots, the visibility was 10 statute miles, and overcast clouds existed at 1,300 feet. The temperature and dew point were 17 and 14 degrees Celsius, respectively, and the altimeter setting was 30.00 inHg.

A surface observation weather report taken at MEI on the day of the accident at 1258, indicated the wind was from 170 degrees at 3 knots, the visibility was 9 statute miles with light rain, and overcast clouds existed at 1,100 feet. The temperature and dew point were 17 and 14 degrees Celsius, respectively, and the altimeter setting was 29.97 inHg.

A surface observation weather report taken at MEI on the day of the accident at 1358, indicated the wind was calm, the visibility was 9 statute miles, and overcast clouds existed at 1,100 feet. The temperature and dew point were 18 and 15 degrees Celsius, respectively, and the altimeter setting was 29.96 inHg.

WRECKAGE AND IMPACT INFORMATION

Examination of the accident site and wreckage was initially performed by an FAA airworthiness inspector. The wreckage was located at 32 degrees, 49.765 minutes North latitude and 088 degrees, 57.196 minutes West longitude, or approximately 133 nautical miles and 297 degrees from the departure airport. The crash site was also located approximately 106 nautical miles and 122 degrees from the intended fuel stop airport.

The FAA inspector who examined the accident site reported the airplane crashed in a heavily wooded area, which was difficult to access from the ground. The trees at the accident sight were tall pines and an unknown species of hardwood saplings. Aircraft debris was noted along the energy path among the trees. The first impact was at two pine trees. The left horizontal and elevator were separated from the aircraft and located near there. Pieces of fiberglass, aluminum, and other debris were scattered up to the final resting position. The aircraft came to

rest against another tall pine tree. The nose was down and the tail was off the ground. The fuselage and left wing were consumed in the fire. The right wing was totally demolished. The right horizontal and vertical were still connected to the empennage. All parts of the aircraft appeared to be present. A search of the crash site and wreckage for a global positioning system (GPS) receiver was not successful. The airplane was recovered for further examination.

Examination of the airframe and engine was performed by representatives of the airframe and engine manufacturer's with FAA oversight. Examination of the airframe revealed it was fragmented and burnt. The wings were completely separated from the fuselage and fragmented, and the forward section of the fuselage frame was also fragmented. The fiberglass hopper was broken up into numerous pieces. Both main landing gear legs were separated from the forward structure of the fuselage. The cockpit section of the fuselage was also fragmented. Numerous tubes of the aft fuselage were bent. The vertical stabilizer remained attached to the aft fuselage, but the rest of the empennage surfaces were not attached to the fuselage. The vertical stabilizer was attached to the aft fuselage and damaged by fire. The empennage, except for the vertical fin was found separated from the fuselage. The elevators remained attached to the stabilizers at the hinge points. The left stabilizer and elevator were partially consumed by fire. The rudder was separated from the stabilizer at the hinge points and was also consumed by fire. The base of the rudder with the control cable horn was found. Numerous empennage attach fittings and attach bolts were found broken.

Inspection of the flap and aileron control surfaces revealed each respective control surface was fragmented. Rudder control cable continuity was confirmed from the pedal attach fitting to the rudder control horn near the control surface. The forward end of the cables remained attached to a steel fitting; however, fire melted an aluminum fitting that connects the steel fitting to the pedal assembly. Melted aluminum was observed under the bolt that attaches the aluminum channel to the fitting. The elevator flight control system was damaged by the fire. The aluminum push pull tube in the aft fuselage was consumed by fire. The bearing of the forward push pull rod at the control stick was found broken. The bolt and nut attaching the pushrod bearing to the stick was found in place. All the other rod end bearing connections of the elevator control system were found properly secured. The aileron control system sustained substantial damage. The push pull rods, cranks and idlers in the fuselage were damaged by fire and impact. All of the components of the system were not located due to extensive damage. Several of the system rod end bearings were found broken. All push pull rods and tubes found were bent and or broken. No rod end connecting hardware was found missing and those that were observed were properly installed. Inspection of the secondary flight control systems revealed no evidence of preimpact failure or malfunction. All parts of the wing flap control system were not accounted for. The flap control system components were damaged by fire and impact with push rods bent and broken. The flap actuator jack screw was not located; therefore no determination of flap position could be made.

The engine mount and nacelle were broken into many pieces. Several pieces of the mount ring were found in the wreckage debris. Pieces of the tubular engine mount were compressed to about 1/2 the nominal length.

Examination of the cockpit revealed the upper and lower instrument panels were consumed by fire. The airspeed indicator was separated from the instrument panel and the needle was captured at 208 mph. Examination of the pilot's seat frame and seat rails revealed the seat rails were significantly bowed forward. The seat bottom frame was bent down and to the right.

Examination of the engine revealed it displayed severe impact damage, including rupture and structural separation of the engine housings, which precluded assessment of the pre-impact integrity of the engine to airframe connections, and also formal disassembly. The propeller shaft was impact fractured. The exhaust duct was completely fractured and torn from the reduction gearbox rear housing, exposing the power turbine shaft housing. The gas generator case housing displayed severe impact deformation; the fuel manifold was in place and exhibited impact damage. The rear housing of the accessory gearbox was fractured from the forward housing. The accessory gearbox mounted controls and accessories were all fractured from their mounting bosses. The high pressure fuel pump and fuel control unit were recovered separately. Impact damage to the power control and reversing linkage, compressor discharge air (P3) and power turbine control (Py) pneumatic lines precluded assessment of pre-impact integrity. The gas generator was mechanically sectioned for access to the turbine section. Inspection of the compressor 1st stage revealed no indications of operational distress. The compressor turbine shroud displayed circumferential rubbing due to radial contact with the compressor turbine blade tips, and the compressor turbine blade airfoils displayed circumferential rubbing to the tips due to radial contact with the shroud. The downstream face displayed severe circumferential rubbing, with frictional heat discoloration and material smearing, due to axial contact with the 1st stage power turbine vane ring.

Further examination of the engine revealed the 1st Stage Power Turbine Vane Ring vane airfoils were impact fractured around their root sections and the inner drum and baffle were liberated from the vane ring. The upstream side baffle face displayed severe circumferential rubbing and scoring, with frictional heat discoloration and material smearing, due to making axial contact with the compressor turbine. The baffle inner cup

was completely machined away due to axial contact between the compressor turbine and power turbine retaining nut. The 2nd stage power turbine vane airfoils were intact. The airfoil trailing edges were circumferentially rubbed and deformed due to contact with the 2nd stage power turbine. The 2nd stage power turbine shroud displayed heavy circumferential rubbing and machining, with frictional heat discoloration and material smearing, due to contact with the 2nd stage power turbine blade tips. The 2nd stage power turbine blade airfoils were impact fractured at their roots due to contact with the vane ring and shroud. The disc face displayed heavy circumferential rubbing and material smearing due to contact with the power turbine shaft housing. Heavy circumferential rubbing due to axial contact with the 2nd stage power turbine was noted on the power turbine shaft and shaft housing aft face. The power turbine shaft was impact fractured. Both fracture faces displayed severe circumferential rubbing and deformation. Examination of the reduction gearbox revealed the 2nd stage planet gear carrier gear to propeller shaft spline mounting webs were fractured in torsion. The fractured webs displayed counter clockwise torsional deformation. The 1st and 2nd stage gearing displayed no indications of operational distress. The observed gearing of the accessory gearbox displayed no indications of operational distress. Impact damage to the engine controls and accessories was noted, which precluded detailed examination and operational testing.

MEDICAL AND PATHOLOGICAL INFORMATION

A postmortem examination of the pilot was performed by the Mississippi State Medical Examiner's Office, Jackson, Mississippi. The cause of death was listed as "thermal injuries." The autopsy report also indicates that no soot was visible in the larynx, trachea, bronchi, or esophagus, and that extensive charring of the remains obscured any blunt force injury that may

have been sustained prior to death.

Forensic toxicology was performed on specimens of the pilot by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. The toxicology report stated that testing for carbon monoxide and cyanide was not performed. The results were negative for volatiles and tested drugs.

History of Flight

Enroute	VFR encounter with IMC (Defining event) Collision with terr/obj (non-CFIT)
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Pilot Information

Certificate:	Commercial	Age:	48, 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 Without Waivers/Limitations	Last Medical Exam:	03/25/2008
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	02/10/2007
Flight Time:	7500 hours (Total, all aircraft), 2500 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	AIR TRACTOR INC	Registration:	N5013C
Model/Series:	AT-602	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Restricted	Serial Number:	602-0428
Landing Gear Type:	Tailwheel	Seats:	1
Date/Type of Last Inspection:	11/03/2008, 100 Hour	Certified Max Gross Wt.:	12500 lbs
Time Since Last Inspection:		Engines:	1 Turbo Prop
Airframe Total Time:	5700 Hours	Engine Manufacturer:	P&W CANADA
ELT:	Not installed	Engine Model/Series:	PT6A-60AG
Registered Owner:	QUINN AVIATION INC	Rated Power:	1050 hp
Operator:	QUINN AVIATION INC	Air Carrier Operating Certificate:	
Operator Does Business As:		Operator Designator Code:	ZGWG

Meteorological Information and Flight Plan

Observation Facility, Elevation:	MEI, 297 ft msl	Observation Time:	1158 CST
Distance from Accident Site:	31 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	161°	Conditions at Accident Site:	Instrument Conditions
Lowest Cloud Condition:		Temperature/Dew Point:	17° C / 14° C
Lowest Ceiling:	Overcast / 1300 ft agl	Visibility	10 Miles
Wind Speed/Gusts, Direction:	3 knots, 190°	Visibility (RVR):	
Altimeter Setting:	30.001 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Greenville, AL (PRN)	Type of Flight Plan Filed:	None
Destination:	Cleveland, MS (RNV)	Type of Clearance:	None
Departure Time:	1124 CST	Type of Airspace:	Unknown

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal		

Administrative Information

Investigator In Charge (IIC):	Timothy W Monville	Adopted Date:	10/21/2010
Additional Participating Persons:	Michael E Jones; FAA/FSDO; Jackson, MS Marc Graton; Pratt & Whitney Canada; Montreal, Jim Hirsch; Air Tractor; Olney, TX		
Publish Date:	10/21/2010		
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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.

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