Aviation Investigation Final Report

Location:	Florence, South Carolina	**Accident Number:**	ATL03FA041
Date & Time:	February 6, 2003, 18:53 Local	**Registration:**	N5587P
Aircraft:	Piper PA-24-250	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

During a cross-country instrument flight at 5,300 feet the pilot radioed that he was having difficulty maintaining altitude. The air traffic controller reported the lost of radar and radio contact with the airplane at 1853. Local authorities were notified, and launched a ground and air search for the downed airplane. The airplane wreckage was located in a wooded area at 0815 on February 7, 2003. Examination of the wreckage did not reveal any airframe or mechanical malfunctions. According to the Federal Aviation Administration Advisory Circular #60-4A: during periods of low visibility a pilot is particularly vulnerable to spatial disorientation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot experienced spatial disorientation, which resulted in a loss of control and the subsequent collision with the ground. A factors was dark night and clouds.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: DESCENT - UNCONTROLLED

Findings
1. (F) LIGHT CONDITION - DARK NIGHT

2. (C) AIRCRAFT CONTROL - NOT MAINTAINED - PILOT IN COMMAND
3. (C) SPATIAL DISORIENTATION - PILOT IN COMMAND
4. (F) WEATHER CONDITION - CLOUDS

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

Findings
5. TERRAIN CONDITION - GROUND
6. OBJECT - TREE(S)

Factual Information

HISTORY OF FLIGHT

On February 6, 2003, at 1853 eastern standard time, a Piper PA-24-250, N5587P, registered to and operated by Hartford Holding Corporation, collided with trees while maneuvering in the vicinity of Florence, South Carolina. The positioning flight was operated under the provisions of Title 14 CFR Part 91 with an instrument flight plan filed. Instrument meteorological conditions prevailed at the time of the accident. The airplane was destroyed, and the certificated flight instructor, the certificated flight instructor-rated passenger, and the other passenger received fatal injuries. The flight departed Ormond Beach Municipal Airport, Ormond Beach, Florida, on February 6, 2003 at 1530.

The flight was en route to Marlboro County Avent Field in Bennettsville, South Carolina. According to radar data, about 1841, the flight was at 5,300 feet transitioning the airspace of Florence Regional Airport, Florence, South Carolina, and the pilot contacted Florence air traffic control and requested if there was any visual weather conditions to the north. The controller provided the pilot with the weather information he had at the time, which was 600 feet overcast at Fayetteville, North Carolina. The pilot elected to proceed to Fayetteville, North Carolina. The controller cleared the flight direct to Fayetteville, North Carolina, and instructed the pilot to descend to 5,000 feet and join victor airway 56.

According to radar data, about 1849, the airplane's altitude was at 800 feet, and the controller instructed the pilot to climb. The controller requested the pilot to identify if he was having problems. The pilot responded that he needed a radar heading and he was at 1,800 feet and climbing. At 1850, the pilot requested to land in the closest "weed field". Air traffic control gave the pilot a heading and the distance of the Florence Regional Airport, and requested a no-gyro approach into Florence Regional. At 1852, the pilot radioed that he was having a hard time maintaining altitude between 2,300. The controller lost radar and radio contact with the airplane at 1853. The local authorities were notified that an airplane had gone down and search parties on the ground and in the air located the wreckage in a wooded area at 0815 on February 7, 2003.

PERSONNEL INFORMATION

The certified flight instructor was issued a commercial pilot certificate on November 24, 1999, with airplane single and muti-engine land, and instrument ratings. Review of the pilot logbook revealed a total flight time of 716 hours but his flight time in the Piper PA-24-250 was undetermined. The certified flight instructor held a second-class medical certificate dated October 5, 2000, valid when wearing corrective lenses.

AIRCRAFT INFORMATION

A review of N5587P logbooks revealed that the last recorded altimeter, static, and transponder system checks were completed on May 7, 2002. The last annual inspection was conducted on May 20, 2002. The tachometer time at the annual inspection was 1108.9 and the airframe total time was 2962.5. The airplane was not equipped with a pitot tube heating system.

METEOROLOGICAL INFORMATION

A review of recorded weather data revealed at 1853 at Florence Regional Airport, Florence, South Carolina, reported conditions were winds 050 at 9 knots, visibility 4 statute miles with light rain, broken clouds at 600 feet above ground level, overcast clouds at 1,500 feet above ground level, temperature 3 degrees Celsius, dew point minus 1 degree Celsius, altimeter 30.12 inches, with remarks that the ceiling was variable between 300 feet to 800 feet above ground level. A review of astronomical data for the location of the accident revealed sunset was 1754 eastern standard time, and the end of civil twilight was 1820 eastern standard time.

WRECKAGE AND IMPACT INFORMATION

Examination of the accident site revealed the wreckage was 5.9 nautical miles north of the Florence Regional Airport, Florence, South Carolina. The wreckage debris was scattered approximately 100 feet along a 360-degree magnetic heading from a tree freshly broken approximately 50 feet above the ground. Approximately 51 feet from the base of the tree, one propeller blade was found separated and embedded in a two-foot deep, seven-foot long, five-foot wide crater. The powerplant was found separated and resting inverted adjacent to the fuselage. Both wing assemblies displayed crush damage from the leading edge aft. A seven-foot section of the left outboard wing assembly was located approximately 25 feet above the ground in a tree. The empennage aft of the cargo door and the tail assembly were found inverted and resting on top of the wing assembly.

Examination of the cabin section of the airframe revealed it was damaged. Examination of the cockpit revealed the flight control cables were separated. The vertical stabilizer section of the airplane was intact with the rudder post separated. The rudder cables were attached to the bellcrank and traced to the cockpit. The stabilator and stabilizer trim cables were separated. Examination of the flight control instruments revealed the directional gyro rotor vanes showed damaged on the circumference. The attitude indicator showed scoring on the circumference of the rotor housing, and the electric turn and bank indicator showed scoring on the rotor.

Examination of the left wing assembly revealed accordion crush damage along the leading edge of the wing. The left aileron was separated from the wing assembly and bracken in two places. One aileron cable was attached to the bellcrank and the other broken off of the bellcrank. The left flap assembly was partially detached from the wing and broken in two parts. The left main landing gear was found in the retracted position.

Examination of the right wing assembly revealed accordion crush damage along the leading edge of the wing. Both aileron control cables were attached to the bellcrank, and traced to the cockpit section. The right main landing gear was partially extended, and the flap was crush damaged. Examination of the airframe did not reveal any anomalies at the conclusion of the examination.

Examination of the engine revealed both case halves were broken, and exposed the crankshaft seal. The propeller flange was bent into the case. The engine driven fuel pump, carburetor, and left magneto were destroyed. Crankshaft rotation was obtained and rear accessory drive gears: vacuum pump, magneto, and tachometer were observed rotating. The engine driven fuel pump actuation arm moved when movement of the crankshaft was facilitated. Compression and piston movement was observed in engine cylinders. Examination of the engine revealed no mechanical malfunctions at the conclusion of the examination.

MEDICAL AND PATHOLOGICAL INFORMATION

Office of the medical examiner, Darlington County, South Carolina performed the pathological diagnoses of the pilot on February 8, 2003. The cause of death was "blunt force trauma". The Forensic Toxicology Research Section, Federal Aviation Administration, Oklahoma City, Oklahoma performed postmortem toxicology of specimens from the pilot. The results were negative for carbon monoxide, cyanide. 15 (mg/dL, mg/hg) Ethanol was detected in the muscle. 21 (mg/dL, mg/hg) Ethanol was detected in the liver. 15 (mg/dL, mg/hg) Acetaldehyde was detected in the liver. " The ethanol found in this case is from postmortem ethanol formation and not from the ingestion of ethanol."

ADDITIONAL INFORMATION

The wreckage of the Piper PA-24-250, N5587P was released to an insurance adjuster with United States Aviation Underwriters on March 1, 2004.

Review of Federal Aviation Regulation (section 23.1323, subpart F, Airspeed indicating system, part d) states: If certification for instrument flight rules or icing conditions is requested, each airspeed system must have a heated pitot tube or an equivalent means of preventing malfunction due to icing.

According to the Federal Aviation Administration Advisory Circular #60-4A: during periods of low visibility a pilot is particularly vulnerable to spatial disorientation.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	44,Male
Airplane Rating(s):	Single-engine land; 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	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	October 5, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	716 hours (Total, all aircraft), 624 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N5587P
Model/Series:	PA-24-250	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-652
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 20, 2002 Annual	**Certified Max Gross Wt.:**	2800 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2962 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-540-A1A5
Registered Owner:	Hartford Holding Corporation	**Rated Power:**	250 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	FLO,146 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	18:53 Local	**Direction from Accident Site:**	180°
Lowest Cloud Condition:	Unknown	**Visibility**	4 miles
Lowest Ceiling:	Broken / 600 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	50°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	3°C / -1°C
Precipitation and Obscuration:	Light - None - Rain		
Departure Point:	Ormond Beach, FL (OMN)	**Type of Flight Plan Filed:**	IFR
Destination:	Bennettsville, SC (BBP)	**Type of Clearance:**	IFR
Departure Time:	15:30 Local	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	2 Fatal	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 Fatal	**Latitude, Longitude:**	34.279167,-79.759719

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric
Additional Participating Persons:	Larin J Kaasa; Columbia FSDO David C Moore; Lycoming George Hollingsworth; Piper
Original Publish Date:	July 29, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=56457