Aviation Investigation Final Report

Location:	White Plains, New York	**Accident Number:**	ERA14FA288
Date & Time:	June 13, 2014, 08:08 Local	**Registration:**	N5335R
Aircraft:	Piper PA-46-500TP	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot arrived at the fixed-base operator on the morning of the accident and requested that his airplane be brought outside and prepared for an immediate departure; this occurred 1 hour 15 minutes before his scheduled departure time. Radar data showed that the airplane departed 23 minutes later. According to air traffic control data, shortly thereafter, the ground and departure controllers contacted the tower controller and asked if the airplane had departed yet; the tower controller responded, "I have no idea. We have zero visibility." Weather conditions about the time of the accident included a 200-ft overcast ceiling with about 1/4-mile visibility.

Only five radar targets identified as the accident airplane were captured, and all of the targets were located over airport property. The first three radar targets began about midpoint of the 6,500-ft-long runway, and each of these targets was at an altitude of about 60 ft above ground level (agl). The final two targets showed the airplane in a shallow right turn, consistent with the published departure procedure track, at altitudes of 161 and 261 ft agl, respectively. The final radar target was about 1/2 mile from the accident site. Witnesses reported observing the airplane impact trees in a wings-level, slightly right-wing-down attitude at high speed. Examination of the wreckage revealed no preimpact mechanical malfunctions or anomalies of the airplane.

The pilot's personal assistant reported that the pilot had an important meeting that required his attendance on the day of the accident flight. His early arrival to the airport and his request to have the airplane prepared for an immediate departure were actions consistent with self-induced pressure to complete the flight. Due to the poor weather conditions, which were expected to continue or worsen, he likely felt pressure to expedite his departure to ensure he was able to make it to his destination and to attend the meeting. This pressure may have further affected his ability to discern the risk associated with departing in low-visibility and low-ceiling conditions.

As noted, the weather conditions were so poor that the local air traffic controller stated that he could not tell whether the airplane had departed. Such weather conditions are highly conducive to the development

of spatial disorientation. Further, the altitude profile depicted by the radar data and the airplane's near wings-level attitude and high speed at impact were consistent with the pilot experiencing a form of spatial disorientation known as "somatogravic illusion," in which the pilot errantly perceives the airplane's acceleration as increasing pitch attitude, and efforts to hold the nose down or arrest the perception of increasing pitch attitude can exacerbate the situation. Such an illusion can be especially difficult to overcome because it typically occurs at low altitudes after takeoff, which provides little time for recognition and subsequent corrective inputs, particularly in very low-visibility conditions.

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 a positive climb rate after takeoff due to spatial disorientation (somatogravic illusion). Contributing to the accident was the pilot's self-induced pressure to depart and his decision to depart in low-ceiling and low-visibility conditions.

Findings

Personnel issues	Stress - Pilot
Environmental issues	Low visibility - Decision related to condition
Environmental issues	Low ceiling - Decision related to condition
Personnel issues	Visual illusion/disorientation - Pilot
Aircraft	Altitude - Not attained/maintained
Environmental issues	Low visibility - Contributed to outcome
Environmental issues	Low ceiling - Contributed to outcome
Personnel issues	Decision making/judgment - Pilot
Aircraft	Climb rate - Not attained/maintained
Personnel issues	Use of equip/system - Pilot

Factual Information

History of Flight

Prior to flight	Miscellaneous/other
Initial climb	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On June 13, 2014, at 0808 eastern daylight time, a Piper PA-46-500TP, N5335R, was destroyed when it collided with trees and terrain after takeoff from runway 16 at Westchester County Airport (HPN), White Plains, New York. The private pilot was fatally injured. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the personal flight, which was destined for Portland International Jetport (PWM), Portland, Maine. The flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

The pilot had flown from PWM to HPN the previous day for a family event. The fixed base operator (FBO) at HPN serviced the airplane with 60 gallons of fuel, which filled the tanks, and was advised to expect the pilot at 0900 the next day for his return flight to PWM. Instead, the pilot arrived at the FBO at 0745, and requested his airplane be brought outside and prepared for departure immediately. The pilot contacted HPN ground control and was provided taxi instructions, and was subsequently cleared for takeoff by the control tower.

Air traffic control and radar information from the Federal Aviation Administration (FAA) revealed that the airplane departed at 0808, and that the HPN air traffic control tower was contacted shortly thereafter by the ground controller and the departure controller, inquiring if the airplane had departed yet. The tower controller responded, "I have no idea. We have zero visibility."

Only five radar targets identified as the accident airplane were captured, and all were over HPN airport property. The first three radar targets began about mid-point of the 6,500-foot runway, and each indicated an altitude of about 500 feet mean sea level (msl). The airport elevation was 439 feet. The next and final two targets depicted a shallow right turn at 600 feet and 700 feet, respectively, before radar contact was lost. The final radar target was about one half-mile from the accident site.

The airplane collided with trees and terrain behind a house, and in front of horse stables on residential property. Two witnesses at the stables were interviewed, and their statements were consistent throughout. They each stated that the weather was "dark, rainy, and foggy," and their attention was drawn to the airplane when it "appeared" out of the clouds immediately above the trees, traveling "very fast." One witness stated that he heard the airplane before he saw it. They stated that the airplane impacted trees in a level attitude, and upon impact, was enveloped by a cloud of "blue smoke" with the odor of diesel fuel.

Pilot Information

Certificate:	Private	**Age:**	65
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	July 10, 2012
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	5100 hours (Total, all aircraft), 134 hours (Total, this make and model)		

The pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent FAA Class 3 Limited, Special Issuance medical certificate was issued on November 25, 2013 and was not valid for any class after July 31, 2014. The pilot reported 5,100 hours of flight experience on his most recent medical certificate application.

The pilot's total flight experience could not be reconciled, but examination of the pilot's most recent logbook revealed the pilot had logged 5,371.6 total hours of flight experience. In 2013, he logged 126.7 hours of flight experience, all of which was in the accident airplane. In 2014, he logged 7.3 hours, with the last entry on February 28, 2014.

On a separate page, a pre-printed sticker from a flight school dated May 14, 2014, reflected an aircraft specific instrument proficiency check and flight review were satisfactorily completed. The training included 9.9 hours of ground school and 1.1 hours of flight training on that date.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N5335R
Model/Series:	PA-46-500TP	**Aircraft Category:**	Airplane
Year of Manufacture:	2001	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4697100
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	June 3, 2014 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Turbo prop
Airframe Total Time:	1931 Hrs at time of accident	**Engine Manufacturer:**	P&W
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	PT6A SER
Registered Owner:	ROCKEFELLER RICHARD	**Rated Power:**	850 Horsepower
Operator:	ROCKEFELLER RICHARD	**Operating Certificate(s) Held:**	None

According to FAA records, the airplane was manufactured in 2001, and was equipped with a Pratt & Whitney PT6A-42A, 850 hp turboprop engine. The most recent annual inspection was completed June 3, 2014, at a total aircraft time of 1,927.2 hours.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HPN,439 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	08:15 Local	**Direction from Accident Site:**	185°
Lowest Cloud Condition:		**Visibility**	0.25 miles
Lowest Ceiling:	Overcast / 200 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots / None	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	90°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.85 inches Hg	**Temperature/Dew Point:**	17°C / 17°C
Precipitation and Obscuration:	N/A - None - Fog		
Departure Point:	White Plains, NY (HPN)	**Type of Flight Plan Filed:**	IFR
Destination:	Portland, ME (PWM)	**Type of Clearance:**	IFR
Departure Time:	08:06 Local	**Type of Airspace:**	Class D

The 0815 weather observation at HPN, 1 mile north of the accident site, included an overcast ceiling at 200 feet and one-quarter mile visibility in fog. The wind was from 090 degrees at 6 knots. The temperature was 17 degrees C, the dew point was 17 degrees C, and the altimeter setting was 29.85

inches of mercury.

Weather at PWM at the proposed time of arrival included an overcast ceiling at 300 feet with 1.5 miles of visibility in light rain and fog.

Airport Information

Airport:	Westchester County HPN	**Runway Surface Type:**	Asphalt
Airport Elevation:	438 ft msl	**Runway Surface Condition:**	Wet
Runway Used:	16	**IFR Approach:**	None
Runway Length/Width:	6549 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	41.509998,-73.704719

The wreckage was examined at the accident site on June 14, 2014. There was a strong odor of fuel, and all major components of the airplane were accounted for at the scene. The wreckage path was oriented on a heading of 270 degrees magnetic and was approximately 360 feet in length. The initial impact point was in a tree approximately 60 feet high, and the airplane impacted several other trees before impacting the ground about 205 feet beyond the first tree strike. Several pieces of angularly-cut wood were found the length of the debris field.

The airplane was fragmented, and scattered along the length of the wreckage path. Control continuity to the wings could not be confirmed due to multiple breaks in the control cables and bellcranks, but all fractures appeared consistent with overload failure. Control continuity was confirmed from the cockpit to the rudder and elevator.

The fuselage lay on its left side against a tree, 280 feet down the wreckage path. The instrument panel and cockpit were destroyed by impact. The cabin and empennage were largely intact. The landing gear and wing flaps were retracted.

The engine and propeller were both about 290 feet down the wreckage path, and separated by approximately 20 feet. All four propeller blades exhibited similar twisting, bending, leading and trailing edge gouging, and chord-wise scratching. One propeller blade was fractured near its root and on its outboard tip, but the associated pieces were located at the accident site.

The engine was separated from the airplane and found upright. The accessory gearbox and inlet case were fractured at numerous locations. The accessory gearbox spur gears and fractured sections of the accessory gearbox were recovered at the site.

The first-stage compressor blades tips were all bent opposite the direction of rotation. The exhaust duct and gas generator were compressed from impact.

The gas generator case was sectioned between the "C" flange and the fuel nozzle bosses to access the hot section components. The upstream side of the first stage power turbine blades and disc exhibited rotational scoring from contact with the downstream side of the first-stage power turbine vane and baffle. The power turbine retention nut exhibited rotational scoring from contact with the downstream side of the first-stage power turbine baffle.

The downstream side of the compressor turbine disc and blades exhibited rotational scoring from contact with the upstream side of the first stage power turbine vane and baffle.

Medical and Pathological Information

The Westchester County Office of Laboratories and Research, Valhalla, New York, performed the autopsy on the pilot. The autopsy listed the cause of death as blunt force injuries.

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma. Testing was negative for carbon monoxide, ethanol, and all tested-for drugs and their metabolites.

Tests and Research

A touchscreen-capable personal tablet device and an airframe-mounted data acquisition unit were recovered and sent to the NTSB Recorder's Laboratory in Washington, DC for examination. No usable data was recovered from either device.

Additional Information

According to Lockheed-Martin Flight Service (LMFS), the pilot did not obtain a weather briefing from

either LMFS or from a Direct User Access Terminal Service (DUATS) vendor. The pilot filed an IFR flight plan through DUATS, but did not include an alternate airport in the flight plan.

According to 14 CFR Part 91.169, IFR flight plan: Information required; an IFR flight plan for aircraft other than helicopters must include an alternate airport when, "For at least 1 hour before and for 1 hour after the estimated time of arrival, the ceiling will be at least 2,000 feet above the airport elevation and the visibility will be at least 3 statute miles."

The pilot's family and personal staff provided a detailed timeline and narrative description of the pilot's activities on the day of and the days prior to the accident. They detailed work/rest cycles concurrent with a standard work day.

According to the pilot's personal assistant, the pilot had a meeting scheduled the day of the accident that was "very important to him. [He] was unusually punctual, never late and would have been focused on arriving on time."

The Westchester Four departure procedure from HPN included the instructions: "Takeoff Runway 16: Climb heading 162 [degrees] to 800 [feet], then climbing right turn heading 320 [degrees], maintain 3,000 [feet]."

The FAA Airplane Flying Handbook (FAA-H-8083-3) described some hazards associated with flying when visual references, such as the ground or horizon, are obscured. "The vestibular sense (motion sensing by the inner ear) in particular tends to confuse the pilot. Because of inertia, the sensory areas of the inner ear cannot detect slight changes in the attitude of the airplane, nor can they accurately sense attitude changes that occur at a uniform rate over a period of time. On the other hand, false sensations are often generated; leading the pilot to believe the attitude of the airplane has changed when in fact, it has not. These false sensations result in the pilot experiencing spatial disorientation."

The FAA publication Medical Facts for Pilots (AM-400-03/1), described several vestibular illusions associated with the operation of aircraft in low visibility conditions. Somatogravic illusions, those involving the utricle and saccule of the vestibular system, were generally placed into one of three categories, one of which was "the head-up illusion." According to the text, the head-up illusion involves a forward linear acceleration, such as takeoff, where the pilot perceives that the nose of the aircraft is pitching up. The pilot's response to this illusion would be to push the control yoke forward to pitch the nose of the aircraft down. "A night takeoff from a well-light airport into a totally dark sky (black hole) or a catapult takeoff from an aircraft carrier can also lead to this illusion, and could result in a crash."

FAA Advisory Circular AC 60-22, Aeronautical Decision Making, stated, "Pilots, particularly those with considerable experience, as a rule always try to complete a flight as planned, please passengers, meet schedules, and generally demonstrate that they have 'the right stuff.'" One of the common behavioral traps identified was "Get-There-Itis." The text stated, "Common among pilots, [get-there-itis] clouds the vision and impairs judgment by causing a fixation on the original goal or destination combined with a total disregard for any alternative course of action."

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	
Original Publish Date:	July 7, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89434