



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Harbor Springs, Michigan	Accident Number:	CEN15FA342
Date & Time:	August 9, 2015, 23:25 Local	Registration:	N43829
Aircraft:	Piper PA 32R-300	Aircraft Damage:	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was completing a long cross-country flight during dark, night visual meteorological conditions. While on a visual approach to the runway, the airplane impacted trees and terrain less than a mile from the end of the runway. The pilot had not logged night flight experience in several years and had not logged any night flight experience in the make and model of the accident airplane. Additionally, he had not logged a flight into the airport in his logbook.

The airport's tree obstructions and nonstandard precision approach path indicator with a 4.0-degree glidepath were noted in the airport facility directory. However, it was the pilot's first flight into the airport; thus, it is likely that his unfamiliarity with the airport environment, including the trees close proximity to the airport and nonstandard glidepath, and the dark, night conditions led to his failure to maintain clearance from the trees. The witness marks on the trees and the damage to the airplane were consistent with the airplane being in a relatively wings level descent when it impacted the tops of the trees. The condition of the landing gear and flaps were consistent with the airplane being configured to land. There were no mechanical anomalies with the airplane, engine, or related systems that would have precluded normal operation at the time of the accident.

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 trees during the approach in dark, night conditions, which resulted in controlled flight into trees and terrain.

Findings

Personnel issues	Monitoring environment - Pilot
Aircraft	Altitude - Not attained/maintained
Environmental issues	Dark - Effect on personnel
Environmental issues	Tree(s) - Effect on operation

Factual Information

History of Flight

Approach-VFR pattern final	Controlled flight into terr/obj (CFIT) (Defining event)
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On August 9, 2015, about 2325 eastern daylight time, a Piper PA 32R-300 airplane, N43829, was substantially damaged when it impacted trees and terrain east of the Harbor Springs Airport (MGN), Harbor Springs, Michigan. The private pilot was fatally injured. The airplane was registered to the Tuskegee Airman National Historical Museum and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Dark night visual meteorological conditions prevailed for the flight, which operated without a flight plan. The flight originated from the Coleman A Young Municipal Airport (DET), Detroit, Michigan, about 2000.

According to the Emmet County Sheriff's Department and colleagues of the pilot, he was flying to MGN for a conference. He communicated with a colleague via text message and indicated he would arrive at MGN around 2325. The wreckage of the airplane was located at 0730 on August 10th by employees of Emmet Brick & Block after they arrived for work. The initial impact point was located at the top of a tree several hundred feet east of the main wreckage.

There were no known witnesses to the impact. Several witnesses reported seeing or hearing a low flying airplane around the time of the accident. The pilot was not receiving services, nor was he required to be, from air traffic control.

Pilot Information

Certificate:	Private	Age:	58, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 Waiver time limited special	Last FAA Medical Exam:	August 5, 2014
Occupational Pilot:	No	Last Flight Review or Equivalent:	January 28, 2015
Flight Time:	406.8 hours (Total, all aircraft), 78.4 hours (Total, this make and model), 0 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

The pilot, age 58, held a private pilot certificate with an airplane single engine land rating reissued on January 28, 2015. The certificate was first issued on July 17, 2009. He was issued a special issuance third class airman medical certificate on August 5, 2014. The certificate contained the limitations "Not valid for any class after 08/31/2015. Must wear corrective lenses for near and distant vision."

On the pilot's medical certificate application, dated July 28, 2014, he reported 380 hours total time, 14 hours in the past 6 months. The pilot's personal flight logbook was located in the wreckage. It contained entries from November 10, 2006, through July 22, 2015. A review of the logbook indicated that the pilot had logged no less than 406.9 hours total time in single engine airplanes; 78.4 hours of which were in the accident airplane and 95.5 hours in high performance/complex airplanes. He received his complex airplane endorsement on November 16, 2011, and his high performance airplane endorsement on July 17, 2012. He had logged 19.5 hours at night and his last logged night flight was on November 8, 2013. He had not logged any night experience in the accident airplane nor did his logbook reflect that he had ever flown to MGN.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N43829
Model/Series:	PA 32R-300	Aircraft Category:	Airplane
Year of Manufacture:	1977	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	32R-7780527
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	July 8, 2015 Annual	Certified Max Gross Wt.:	3600 lbs
Time Since Last Inspection:	17 Hrs	Engines:	Reciprocating
Airframe Total Time:	4842.5 Hrs at time of accident	Engine Manufacturer:	LYCOMING
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-540-K1G5D
Registered Owner:	On file	Rated Power:	300 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

The accident airplane, a Piper PA32R-300 (serial number 32R-7780527), was manufactured in 1977. It was registered with the Federal Aviation Administration (FAA) on a standard airworthiness certificate for normal operations. An Avco Lycoming Aircraft Engine, IO-540-K1G5D, rated at 300 horsepower at 2,700 rpm powered the airplane. The engine was equipped with a Hartzell 3-blade, variable-pitch propeller.

The airplane was registered to the Tuskegee Airman National Historical Museum, Detroit, Michigan, owned by the United States government, and operated by the pilot. The airplane was maintained under an annual inspection program. A review of the maintenance records indicated that an annual inspection had been completed on July 8, 2015, at an airframe total time of 4,825.7 hours (tachometer time 3,648.5). On August 6, 2015, the vacuum pump was removed and replaced. The airplane had flown approximately 16.8 hours between the last inspection and the accident and had a total airframe time of 4,842.5 hours.

The Tuskegee Airman National Historical Museum received the airplane from the Michigan State

Agency for Surplus Property (SASP) for the use of training juveniles in piloting and maintenance. The terms of the five year property transfer contract prohibited the airplane from being rented or used for personal purposes. During this restriction period the airplane was the property of the United States Government.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night/dark
Observation Facility, Elevation:	KMGN,677 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	23:35 Local	Direction from Accident Site:	279°
Lowest Cloud Condition:	Scattered / 4100 ft AGL	Visibility	10 miles
Lowest Ceiling:	Broken / 5000 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	/	Turbulence Type Forecast/Actual:	/ None
Wind Direction:		Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	29.94 inches Hg	Temperature/Dew Point:	20°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Detroit, MI (DET)	Type of Flight Plan Filed:	None
Destination:	Harbor Springs, MI (MGN)	Type of Clearance:	None
Departure Time:	20:00 Local	Type of Airspace:	Class G

The closest official weather observation station was MGN, located 1 nautical mile (nm) west of the accident site. The elevation of the weather observation station was 677 feet mean sea level (msl). The routine aviation weather report (METAR) for MGN, issued at 2335, reported wind calm, visibility 10 miles, sky conditions were scattered clouds at 4,100 feet, broken clouds at 5,000 feet, broken clouds at 6,000 feet, temperature 20 degrees Celsius (C), dew point temperature 19 degrees C, and altimeter 29.94 inches.

According to the United States Naval Observatory, Astronomical Applications Department Sun and Moon Data, the sunset was recorded at 2057 EDT and the end of civil twilight was 2130 EDT. The moon rose at 0207 EDT, and set at 1711 EDT on the day of the accident. The phase of the moon was waning crescent with 23 percent of the moon's visible disk illuminated.

Airport Information

Airport:	HARBOR SPRINGS MGN	Runway Surface Type:	Asphalt
Airport Elevation:	685 ft msl	Runway Surface Condition:	
Runway Used:	28	IFR Approach:	None
Runway Length/Width:	4149 ft / 75 ft	VFR Approach/Landing:	Full stop;Traffic pattern

MGN is a public, uncontrolled airport located three miles east of Harbor Springs, Michigan, at a surveyed elevation of 685.8 feet. The airport had one open runway - runway 10/28 (4,149 feet by 75 feet, asphalt). Runway 10 was equipped with a 4-light precision approach path indicator (PAPI) on the

right side which provided a 3.5 degree glide path. Runway 28 was equipped with a 4-light PAPI on the left which provided a 4.0 degree glide path. The PAPI for runway 28 was classified as nonstandard and unusable beyond 2 degrees left of the centerline of the runway.

Additional remarks for the airport included lighted obstacles for both runway 10 and runway 28. Runway 28 had 80-foot trees in side slope which were lighted, 201 feet from the runway and 170 feet from the runway on both sides of the centerline. The departure procedures for runway 28 also described trees, 100 feet above ground level, abeam the end of the runway and 350 feet south of the runway.

According to the airport manager, after the accident, one of the bulbs (one of eight) in the PAPI system was found inoperative and was immediately replaced. The PAPI system remained operational despite this bulb outage.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	45.424446,-84.899444(est)

The accident site was located in forested terrain just east of the airport. The accident site was at an elevation of 704 feet msl and the airplane impacted on a magnetic heading of 280 degrees.

The initial impact point was characterized by deciduous and coniferous trees. The left wing tip was located in the top of one tree and debris extended from this point west to the main wreckage. The airplane came to rest oriented on a heading of east. The terrain sloped 45 degrees up and to the south. The main wreckage included the engine and propeller assembly, fuselage, and empennage. The right wing separated from the airframe and came to rest adjacent to and north of the main wreckage. The right side of the fuselage was crushed and twisted towards the left. The front windscreen and side windows separated and were fragmented. The bottom of the fuselage was crushed up and twisted to the left.

The engine, instrument panel, and nose landing gear were twisted and the engine came to rest on its left side. The nose landing gear appeared to be extended. All three propeller blades remained attached and exhibited chordwise scratching and leading edge polishing. Two of the three propeller blades exhibited twists and bends.

The followings settings and positions were documented in the cabin:

Kollsman window - 29.93

Fuel selector valve - right tank select

Gear handle - up

Flap control handle – First notch – 10 degrees
Tachometer -3665.3
Hobbs - 1204.2
Mixture Control – full forward
Propeller Control – full forward
Throttle Control – full forward
Alternate Air Door - closed

The right wing included the right aileron. The right flap separated from the wing assembly and was located 5 feet north of the right wing. The flap was buckled at midspan. Buckled and torn metal was observed along the entire leading edge of the right wing. The flight control was continuous from the aileron inboard to the separation point. When the right wing was moved about 1 gallon of fuel was observed and additional fuel poured out. The right main landing gear separated from the wing and was located 10 feet to the north of the right wing. The assembly was otherwise unremarkable.

The left wing separated from the fuselage and was located to the south and uphill from the main wreckage. The outboard leading edge piece separated. Buckled and torn metal was observed along the entire leading edge of the left wing. The landing gear assembly remained attached and was down and locked. The left flap separated partially and remained attached at the flap track. The flap was buckled at midspan. The flight controls were continuous from the left aileron inboard to the separation point.

The empennage included the left and right stabilizers, vertical stabilizer, and rudder. The outboard 22 inches of the leading edge of the left stabilizer were crushed inboard and aft. Tree bark was imbedded within this crush zone. The trim tab was "down." The right stabilizer was not visibly damaged. The upper leading edge of the vertical stabilizer was crushed aft and twisted to the left. The entire horizontal stabilizer was twisted towards the front of the airplane on the right side and the back of the airplane on the left side. Flight controls were continuous from the forward column aft to the stabilizer and rudder. About 7 threads were visible on the stabilizer trim – this correlated to a slight nose up trim setting. Impact damage limited the ability to move the controls at the control yoke or the control surfaces through their full range of motion.

A 55-inch portion of the left wing was located 30 feet east of the main wreckage. This piece was torn at midspan and exhibited leading edge crushing. Bark was embedded along the crush zone. The right wing tip (24-inch piece) was located to the north of the left wing piece and east of the main wreckage.

The rotating beacon, plexiglas, bent and torn metal, broken tree limbs/branches, and personal effects were located in debris field scattered around the main wreckage. Several of the branches exhibited 45 degree cuts.

The airplane was moved from the side of the hill to the level ground below to facilitate further examination.

The upper bank of spark plugs was removed. The number 5 spark plug exhibited signatures consistent with a lean mixture. The number 6 spark plug exhibited signatures consistent with a rich mixture. The valve covers and propeller were removed from the engine and the engine was rotated at the propeller flange. Tactile compression and accessory gears and valve train continuity were observed on all

cylinders.

The fuel manifold contained fuel and was unremarkable. The fuel injector servo was unremarkable and the screen was free of visible debris or contamination. The number 5 fuel injector nozzle was partially occluded. All remaining fuel injector nozzles were unremarkable.

The ignition harness was impact damaged on the left side. The single drive dual magneto was removed from the engine and produced spark when rotated by hand. The vacuum pump rotated when actuated by hand and air movement was observed. Further internal examination revealed no anomalies. The fuel pump contained small amounts of fuel and functioned as designed when actuated by hand.

No preaccident mechanical malfunctions or failures were found that would have precluded normal operation.

Medical and Pathological Information

The autopsy was performed by Sparrow Forensic Pathology on August 11, 2015, as authorized by the Emmett County Medical Examiner's office. The autopsy concluded that the cause of death was "multiple injuries" and the report listed the specific injuries.

The FAA's Civil Aerospace Medical Institute (CAMI), Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological tests on specimens that were collected during the autopsy (CAMI Reference #20150016001). Results were negative for carbon monoxide and ethanol. Testing of cavity blood and urine revealed amlodipine.

The FAA Aerospace Medical Research website listed amlodipine as a "calcium channel blocker heart medication used in the treatment of hypertension." It provided the warning "adverse reactions include edema, dizziness, and palpitation."

On the pilot's medical certificate application dated July 28, 2014, he reported using medication to control his hypertension with no side effects.

Additional Information

According to the FAA Aeronautical Information Manual (AIM) – Chapter 2. Aeronautical Lighting and Other Airport Visual Aids 2-1-2. Visual Glideslope Indicators b. Precision Approach Path Indicator (PAPI). "The precision approach path indicator (PAPI) uses light units similar to the VASI but are installed in a single row of either two or four light units. These lights are visible from about 5 miles during the day and up to 20 miles at night. The row of light units is normally installed on the left side of

the runway..."

Four white lights indicated the glide path was high. Three white lights and one red light indicated the glide path was slightly high. Two white lights and two red lights indicated the glide path was on. One white light and three red lights indicated the glide path was slightly low. Four red lights indicated the glide path was low.

Administrative Information

Investigator In Charge (IIC):	Rodi, Jennifer
Additional Participating Persons:	Ralph J Payne; FAA FSDO; Grand Rapids, MI Charles Little; Piper Aircraft; FL Judson L Rupert; Lycoming Engines; Williamsport, PA
Original Publish Date:	August 23, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=91738

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