Aviation Investigation Final Report

Location:	Cedar Key, Florida	**Accident Number:**	ERA17FA108
Date & Time:	February 12, 2017, 11:06 Local	**Registration:**	N4504X
Aircraft:	Piper PA28R	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	3 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The non-instrument rated private pilot departed in the airplane in visual meteorological conditions, which prevailed along most of the route of the over-water cross-country flight. However, about 20 miles from the destination airport, the airplane encountered an area of instrument meteorological conditions (IMC) that consisted of overcast clouds with bases about 400 ft above the water. According to GPS data, when the airplane reached this area, it began to descend from a cruising altitude of 2,400 ft. About 7 minutes later, at an altitude of about 1,000 ft, the airplane began a left, descending, 180° turn during which the altitude fluctuated until the data ended about 600 ft above the water near the accident site. The airplane continued to descend until it impacted the water. Examination of the wreckage did not reveal any evidence of preimpact mechanical malfunctions that would have precluded normal operation. The pilot had logged only 4.6 hours of simulated instrument experience and had no documented actual instrument experience. No evidence was found indicating that the pilot obtained an official weather briefing before the flight. If he had obtained such a briefing, he would have been told that visual flight rules (VFR) flight was not recommended due to IMC near the destination airport. Given the instrument conditions in the destination area and the pilot's limited instrument flying experience, it is likely that the pilot attempted to continue VFR flight into IMC, experienced spatial disorientation, and lost control of the airplane.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The non-instrument-rated pilot's improper decision to continue visual flight rules flight into instrument meteorological conditions, which resulted in spatial disorientation and a loss of airplane control.

Findings

Personnel issues	Decision making/judgment - Pilot
Personnel issues	Spatial disorientation - Pilot
Aircraft	(general) - Not attained/maintained
Personnel issues	Aircraft control - Pilot
Personnel issues	Total instrument experience - Pilot
Environmental issues	Low ceiling - Decision related to condition
Environmental issues	Below VFR minima - Decision related to condition
Environmental issues	Below VFR minima - Ability to respond/compensate

Factual Information

History of Flight

Enroute-descent	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

On February 12, 2017, about 1106 eastern standard time, a Piper PA-28R-200, N4504X, was destroyed when it impacted the Gulf of Mexico about 7 miles southeast of Cedar Key, Florida. The private pilot and two passengers were fatally injured. The airplane was registered to Flying Arrow, LLC and was being operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91. Instrument meteorological conditions prevailed in the area of the accident site, and no flight plan was filed for the personal flight. The flight departed Brooksville-Tampa Bay Regional Airport (BKV), Brooksville, Florida, at 1037, destined for George T. Lewis Airport (CDK), Cedar Key, Florida.

According to GPS data recovered from a handheld device onboard the airplane, the airplane flew a northwesterly track from BKV toward CDK at a cruising altitude of about 2,400 ft mean sea level (msl) over coastal islands and the Gulf of Mexico. Review of the GPS track and satellite imagery indicated that about 20 nautical miles southeast of CDK, the airplane began to gradually descend near a line of overcast cloud cover that ran from southwest to northeast. Weather data from the closest available reporting stations and from pilot reports indicated that the cloud bases decreased in height from south to north. About 3 minutes later, the airplane's descent rate increased to about 250 ft per minute (fpm) as the airplane continued its northwesterly track. About 4 minutes later, when the airplane was about 7 nautical miles from CDK at an altitude of about 1,000 ft msl, the airplane began a descending left 180° turn. During the turn, the vertical speed varied, and the airplane began a brief climb before descending again at a rate of about 2,900 fpm; the recorded data ended at an altitude of about 570 ft msl.

Pilot Information

Certificate:	Private	**Age:**	65,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	February 19, 2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 13, 2016
Flight Time:	(Estimated) 606 hours (Total, all aircraft), 300 hours (Total, this make and model), 3 hours (Last 90 days, all aircraft)		

According to Federal Aviation Administration (FAA) airmen records, the pilot held a private pilot certificate with a rating for airplane single-engine land. He did not possess an instrument

rating. His most recent FAA third-class medical certificate was issued February 19, 2015, at which time he reported 579 total hours of flight experience. According to his logbook, as of January 28, 2017, he had accrued a total of 606 hours of flight experience that included 3 hours in the 90 days preceding the accident. He had logged a total of 4.6 hours of simulated instrument flight time of which the most recent was 0.3 hour during his last flight review performed on August 13, 2016, in the accident airplane.

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N4504X
Model/Series:	PA28R 200	**Aircraft Category:**	Airplane
Year of Manufacture:	1975	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	28R-7635065
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	May 1, 2016 Annual	**Certified Max Gross Wt.:**	2600 lbs
Time Since Last Inspection:	14 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2806.2 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, not activated	**Engine Model/Series:**	IO-360-C1C
Registered Owner:		**Rated Power:**	200 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

According to FAA records, the airplane was manufactured in 1975. It was equipped with a fuel-injected, horizontally-opposed four-cylinder, direct-drive, air-cooled Lycoming IO-360-C1C engine. Damaged portions of the maintenance logbook were found inside the airplane. The most recent annual inspection was completed May 1, 2016, at 2,806 total airframe hours. The airplane had accrued 14 hours since that date. The engine total time and time since overhaul could not be determined from the logbook remnants.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KCTY,42 ft msl	**Distance from Accident Site:**	36 Nautical Miles
Observation Time:	10:55 Local	**Direction from Accident Site:**	348°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 400 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.25 inches Hg	**Temperature/Dew Point:**	19°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	BROOKSVILLE, FL (BKV)	**Type of Flight Plan Filed:**	None
Destination:	CEDAR KEY, FL (CDK)	**Type of Clearance:**	None
Departure Time:	10:37 Local	**Type of Airspace:**	Class G

There was no record of the pilot obtaining an official weather briefing from flight service or via direct user access terminal.

The Cross City Airport (CTY), Cross City, Florida, located about 36 miles north of the accident site, was the nearest weather reporting station. At 1055, the reported weather at CTY included an overcast ceiling at 400 ft above ground level (agl) with a visibility of 10 miles. Atmospheric models and data from other nearby stations indicated that the conditions at the accident site included fog and low stratus cloud cover up to about 4,000 ft agl. The weather reported for the airplane's route of flight south of the accident location indicated visual meteorological conditions with clear skies below 12,000 ft agl and visibility greater than 5 miles.

The National Weather Service issued an area forecast at 0648 for northern Florida that advised to expect scattered to broken clouds at 1,000 ft agl with visibility 3 miles in mist and scattered clouds at 1,500 ft were expected by 1100. The forecast for the eastern panhandle of Florida included overcast clouds at 1,000 ft agl with visibility 3 miles in mist. Advisories issued at the time of this forecast warned of instrument meteorological conditions at and near the accident site and the destination airport.

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:**	29.049165,-82.968055(est)

The airplane was recovered from the Gulf of Mexico and moved to a secure facility for examination. All major components of the airplane were accounted for except for a large section of the left wing that included the left main landing gear. Flight control continuity was established from the cockpit area through recovery cuts to the attach points on the rudder, stabilator, and stabilator trim jackscrew. Aileron control continuity was established from the cockpit area through overload fractures to the right aileron pushrod and to the root area of the left wing. The right main and nose landing gears were found in the retracted position. The flaps were not recovered; however, the left rod end of the flap torque tube was found in the forward position, consistent with a fully retracted position.

The engine was separated from the airframe. The propeller remained attached to the engine crankshaft flange, and the spinner was crushed against the hub. Two of the propeller blades exhibited longitudinal twisting. The third blade was bent aft about 180° and exhibited leading edge gouging at a distance from the hub consistent with impact damage found on the No. 2 engine cylinder.

The engine was rotated by hand at the propeller, and crankshaft continuity was observed to the rear accessory section. Valve action was observed at each cylinder, and thumb compression and suction were present on cylinders Nos. 1 and 3. Cylinder No. 2 was significantly damaged and exhibited an impact mark consistent with a strike from a propeller blade. A damaged spark plug precluded compression testing of cylinder No. 4. Neither magneto produced spark when rotated by hand. Internal examination of both magnetos revealed that sand, water, and corrosion were present. The vacuum pump remained attached to the engine; the drive coupling, carbon rotor, and carbon vanes were intact.

Medical and Pathological Information

The Office of the Medical Examiner, District 8, Gainesville, Florida, performed an autopsy on the pilot. The cause of death was listed as massive injuries.

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing on the pilot. Results were positive for pioglitazone and sitagliptin, which are used treat type 2 diabetes and to lower blood sugar levels, respectively. In general, neither of these medications are considered to be impairing.

Preventing Similar Accidents

Reduced Visual References Require Vigilance

About two-thirds of general aviation accidents that occur in reduced visibility weather conditions are fatal. The accidents can involve pilot spatial disorientation or controlled flight into terrain. Even in visual weather conditions, flights at night over areas with limited ground lighting (which provides few visual ground references) can be challenging.

Preflight weather briefings are critical to safe flight. In-flight, weather information can also help pilots make decisions, as can in-cockpit weather equipment that can supplement official information. In-cockpit equipment requires an understanding of the features and limitations.

We often see pilots who decide to turn back after they have already encountered weather; that is too late. Pilot's shouldn't allow a situation to become dangerous before deciding to act. Additionally, air traffic controllers are there to help; be honest with them about your situation and ask for help.

Even when flying at night, visual weather conditions can also be challenging. Remote areas with limited ground lighting provide limited visual reference cues for pilots, which can be disorienting or render rising terrain visually imperceptible. Topographic references can help pilots become more familiar with the terrain. The use of instruments, if pilots are proficient, can also help pilots navigate these challenging areas.

See http://www.ntsb.gov/safety/safety-alerts/documents/SA_020.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Brazy, Douglass
Additional Participating Persons:	Randy Ryhal; FAA/FSDO ; Tampa, FL Damian Galbraith; Piper Aircraft; Vero Beach , FL James Childers; Lycoming Engines; Williamsport, PA
Original Publish Date:	February 26, 2019
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=94723