



National Transportation Safety Board Aviation Accident Final Report

Location:	Port Orange, FL	Accident Number:	ERA17FA074
Date & Time:	12/27/2016, 1756 EST	Registration:	N669WR
Aircraft:	INDEPENDENT TECHNOLOGIES INC EPIC LT	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The private pilot obtained a full weather briefing before departing on a long cross-country flight. The destination airport was forecast to be under visual meteorological conditions, but there was an AIRMET and Center Weather Advisory (CWA) issued for low instrument flight rules (IFR) conditions later that day. The briefer told the pilot to check the weather again en route to see if the AIRMET and CWA had been updated. At the time the pilot stopped for fuel, another CWA was issued for low IFR conditions at his destination airport; however, there were no records to indicate that the pilot obtained this information during the fuel stop or after departing on the last leg of the flight.

A review of air traffic control communications revealed that, about 10 minutes before arriving at the airport, the pilot reported that he had obtained the current weather conditions at his destination airport. The most recent observation, about 1 hour before the accident indicated good visibility; however, the weather reporting equipment did not provide ceiling heights. It is unknown if the pilot obtained weather information from nearby airports, which were reporting low instrument meteorological conditions (visibility between 1/4 and 1/2 mile and ceilings 200-300 ft above ground level [agl]). Additionally, three pilot reports (PIREPs) describing the poor weather conditions were filed within the hour before the accident. The controller did not relay the PIREPs or the CWA information to the pilot, so the pilot was likely unaware of the deteriorating conditions.

Based on radar information and statements from witnesses, the pilot's approach to the airport was unstabilized. He descended below the minimum descent altitude of 440 ft, and, after breaking through the fog about 100 ft agl, the airplane reentered the fog and completed a 360° right turn near the approach end of the runway, during which its altitude varied from 100 ft to 300 ft. The airplane then climbed to an altitude about 800 ft before radar contact was lost near the accident site. The airplane came to rest inverted, consistent with one witness's statement that it descended through the clouds in a spin before impact; postaccident examination revealed no preimpact anomalies with the airplane or engine that would have precluded

normal operation. Although the pilot was instrument rated, his recent instrument experience could not be established.

The circumstances of the accident, including the restricted visibility conditions and the pilot's maneuvering of the airplane before the impact, are consistent with a spatial disorientation event. It is likely that the pilot experienced a loss of control due to spatial disorientation, which resulted in an aerodynamic stall and spin.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's loss of airplane control due to spatial disorientation, which resulted in the exceedance of the airplane's critical angle of attack and an aerodynamic stall/spin. Contributing to the accident was the pilot's failure to fly a stabilized approach consistent with the published instrument approach procedure.

Findings

Aircraft	Airspeed - Not attained/maintained (Cause) Angle of attack - Not attained/maintained (Cause)
Personnel issues	Aircraft control - Pilot (Cause) Spatial disorientation - Pilot (Cause) Use of policy/procedure - Pilot (Factor) Lack of action - ATC personnel
Environmental issues	Low visibility - Effect on operation (Cause) Low visibility - Decision related to condition

Factual Information

HISTORY OF FLIGHT

On December 27, 2016, about 1756 eastern standard time, an experimental, amateur-built Epic LT airplane, N669WR, sustained substantial damage when it impacted terrain during an instrument approach to Spruce Creek Airport (7FL6), Port Orange, Florida. The private pilot and passenger were fatally injured. The airplane was privately owned and was operated by the pilot under the provisions of Title 14 *Code of Federal Regulations (CFR)* Part 91. Instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed for the personal flight, which originated from Millington Regional Jetport (NQA), Millington, Tennessee, about 1558, and was destined for 7FL6.

The pilot initially departed from Willmar Municipal Airport (BDH), Willmar, Minnesota, on the morning of the accident, with a planned stop at NQA before proceeding to 7FL6. The pilot received a weather briefing from Lockheed-Martin Flight Service at 1249 before departing BDH. The information provided to the pilot indicated that the terminal area forecast (TAF) predicted visual flight rules (VFR) conditions until 2300; however, an AIRMET and a Center Weather Advisory (CWA) called for low IFR conditions at 7FL6. The briefer told the pilot to check the weather again en route to see if the AIRMET and CWA had been updated, because the CWA was only valid for 2 hours and any new AIRMETs would be released at 1545 or earlier.

The pilot landed at NQA about 1529 and subsequently departed about 1558. There were no records to indicate that the pilot obtained updated weather information during this time. At 1555, a CWA for low IFR conditions (ceilings below 500 ft and visibility below 1/2 mile in fog) was issued and was valid for the accident site until 1755. Another CWA was issued at 1700 and valid until 1900 regarding low IFR conditions.

A review of air traffic control communications provided by the Federal Aviation Administration (FAA) revealed that, about 1741, the pilot told the approach controller that he had the current weather conditions at 7FL6 and the "visibility to get in there." The controller did not provide the pilot with the 1700 CWA. The controller gave the pilot vectors to the final approach course, provided missed approach instructions (fly heading 070° and climb to 2,000 ft), and cleared the flight for the approach. Once the airplane was established on the final approach course, the controller told the pilot that a frequency change was approved. The pilot acknowledged and said that he would call on the ground and cancel his IFR flight plan. There were no further communications from the pilot.

A review of radar data revealed that, during the final 46 seconds of flight, the airplane approached the airport on a northeasterly heading just north of the final approach course. At 1756:01, the airplane was abeam the runway numbers at an altitude of 100 ft mean sea level (msl) (76 ft above ground level) before it initiated a climbing right turn. During the turn, the airplane initially climbed to 200 ft msl then descended to 100 ft msl before climbing up to 300 ft. After completing a 360° turn, the airplane began to climb on a northeasterly heading. Over the next 14 seconds, the airplane climbed to 800 ft, while making a shallow turn to the right

followed by a turn to the left before the data ended at 1756:47. The last radar return was near-coincident with the location of the accident site (See figure 1).

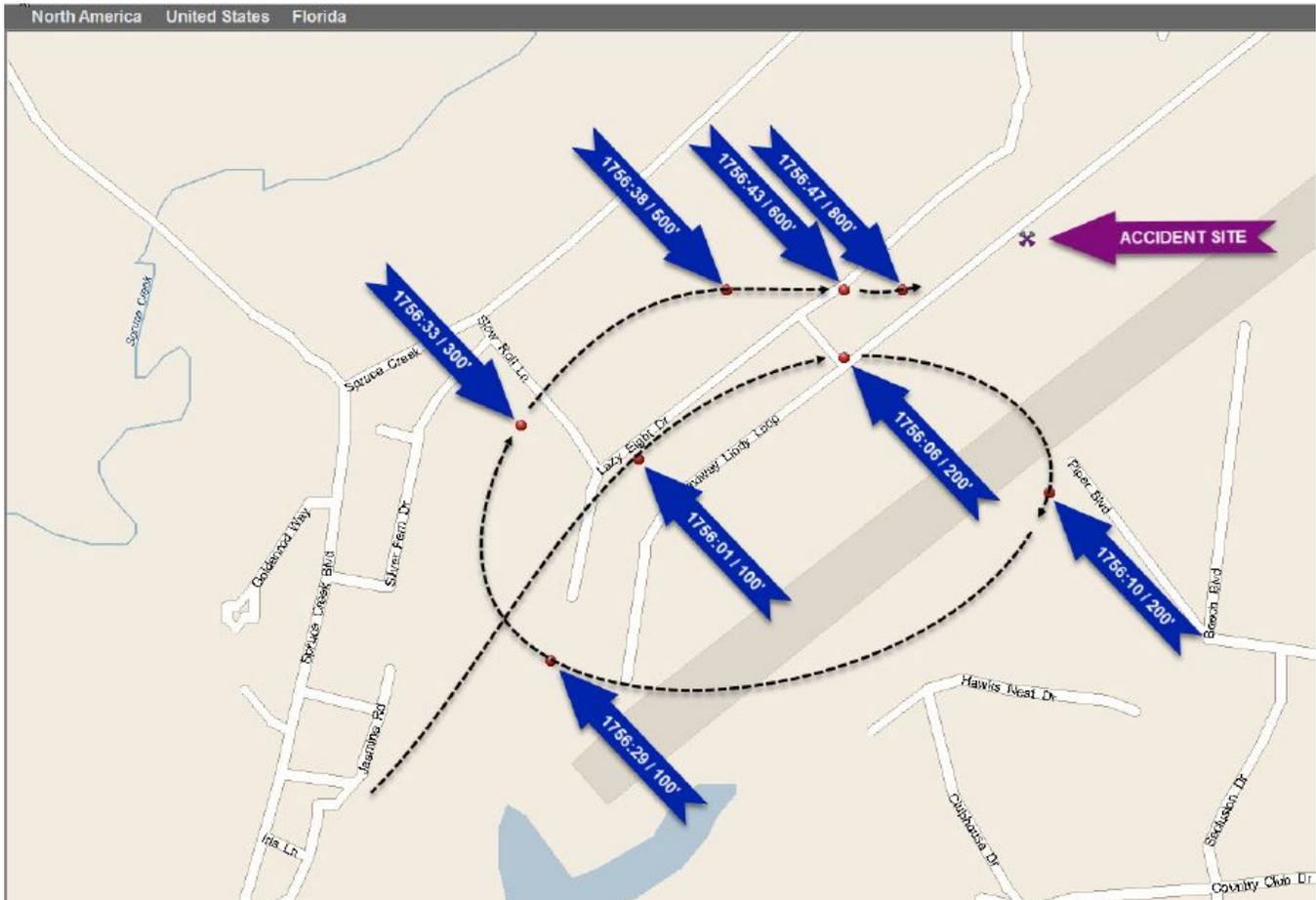


Figure 1. Radar Flight Track of Attempted Landing at 7FL6.

Several witnesses observed the accident. One witness, who was driving to the airport's café, reported that he saw the airplane's landing lights as it approached the airport. The airplane was about 100 ft above ground level (agl) and in a left turn. The airplane then climbed back into the fog layer and disappeared. The witness said, "I didn't hear anything for a few seconds. Then I heard a very loud distinct corkscrewing sound, very familiar to a spinning plane at an airshow. I then saw two wing-tip lights fall through the clouds straight down and heard an extremely loud thud."

Another witness, who was an FAA designated pilot examiner, was monitoring air traffic communications on his handheld radio. He stated that general aviation aircraft were diverting to Deland, Florida, and commercial airliners were diverting to Orlando, Florida, due to "below minimum conditions." The witness said that, when he heard the accident pilot was going to attempt the instrument approach into 7FL6, he became concerned and drove to the runway to watch. The pilot, whom he knew, had a history of "careless and reckless" flying, and the witness was convinced he did not have the "skill set" to fly an instrument approach to minimums. The witness saw the airplane when it broke out of the overcast ceiling about 200 ft agl. At that time, the airplane was about 1/8-mile north of the final approach course. He said that the airplane

suddenly pulled up (thought maybe the airplane struck trees) and banked to the right over the airport into the fog, before it descended in an inverted flat spin to impact. The witness used his cell phone to record part of the approach. The video was consistent with the witness's statement, and the airplane's engine was clearly heard on the video.

A third witness said that he heard a loud engine noise, so he went out onto his lanai and looked up. He saw the airplane emerge from the fog in a 70° to 80° nose-down "fully developed spin." The witness said the airplane made three rotations before he lost sight of it behind trees; he then heard the sound of an impact.

Airport surveillance video captured the final seconds of the flight. The video showed the airplane descending through fog in a spin with its landing lights on just before impact.

PERSONNEL INFORMATION

The pilot held a private pilot certificate with ratings for airplane single- and multi-engine land and instrument airplane. His last FAA third-class medical was issued on December 2, 2016. At that time, he reported 5,635 total hours of flight experience.

On the pilot's most recent insurance application, dated July 2016, he reported 4,246 hours of flight experience, of which 956 hours were in the accident airplane.

The pilot's most recent flight review and Epic Factory Recurrent Training were completed on October 1, 2016. The factory training included both flight and ground instruction. The flight portion included precision and non-precision approaches, unusual attitude recoveries, stall recognition and recovery; however, the pilot's personal logbooks were not available for review and his instrument currency could not be established.

AIRCRAFT INFORMATION

The Epic LT was a kit-built, low-wing, single-engine turboprop airplane that seated six. Its structure was carbon-composite material with retractable landing gear. The airplane was equipped with a 1,200-horsepower Pratt & Whitney PT6-67A engine and a four-blade Hartzell propeller.

The pilot built the airplane and was issued a special certificate of airworthiness from the FAA on December 18, 2009.

A review of the airframe maintenance logbook revealed that the last condition inspection was conducted on August 18, 2016, at an aircraft total time of 822.31 hours. The engine and propeller were inspected on August 17, 2016; both had accrued the same time as the airframe.

METEOROLOGICAL INFORMATION

Whether the pilot obtained additional weather information during the flight to 7FL6 could not be determined.

The 1655 automated weather observation at 7FL6 included wind from 070° at 4 knots, visibility 25 miles, temperature 68°F, dew point 65°F, and an altimeter setting of 30.18 inches of

mercury.

The airport's weather reporting system was not equipped to provide cloud ceiling heights.

The 1755 automated weather observation at 7FL6 included calm wind, visibility 2 1/2 statute miles, mist, temperature 67°F, dew point 66°F, and an altimeter setting of 30.18 inches of mercury.

The second closest official weather station to the accident site was at the New Smyrna Beach Municipal Airport (EVB), New Smyrna Beach, Florida, about 5 miles east of the accident site.

The 1650 weather observation at EVB included wind from 090° at 4 knots, 1/2-mile visibility, fog, overcast ceiling at 200 ft, temperature 67° F, dew point 67° F, and an altimeter setting of 30.17 inches of mercury.

The 1750 weather observation at EVB included wind from 090° at 4 knots, visibility 1/4 statute mile, fog, overcast ceiling at 100 ft, temperature 67° F, dew point 67° F, and an altimeter setting of 30.18 inches of mercury.

The third closest weather reporting system was at the Daytona International Airport (DAB), Daytona Beach, Florida, located about 6 miles north of the accident site. The 1726 observation included wind from 090° at 4 knots, visibility 1/4-mile in fog, overcast ceiling 300 ft, temperature 67° F, dew point 67° F, and an altimeter setting of 30.19 inches of mercury.

The 1753 observation at DAB included wind from 110° at 5 knots, visibility 1/4-mile in fog, vertical visibility 300 ft, temperature 67° F, dew point 67° F, and an altimeter setting of 30.19 inches of mercury.

No AIRMETs were issued or valid for the accident site at the time of the accident; however, an AIRMET for IFR conditions was issued for areas north of the accident site.

Three separate pilot reports (PIREPs) that reported low IFR conditions were recorded within 1 hour and in the vicinity of the accident. However, these reports were not disseminated to the pilot by the air traffic controller.

According to the U.S. Naval Observatory Astronomical Applications Department, sunset was at 1734 and the end of civil twilight was at 1800.

AIRPORT INFORMATION

7FL6 was a private, residential airport that has a 4,000-ft-long by 176-ft-wide paved and lighted runway oriented 05/23. The airport was owned and managed by the Spruce Creek Fly-In Property Owners Association. The pilot was a resident of Spruce Creek.

The published inbound course for the RNAV (GPS) Rwy 5 approach at 7FL6 was 057° magnetic, and the landing minimums for a straight-in approach were a 440-ft msl minimum descent altitude and visibility 1 statute mile. The airport elevation was 24 ft msl.

The approach procedure was not authorized at night.

WRECKAGE INFORMATION

The airplane came to rest inverted at the base of an approximate 50-ft-tall tree on the front lawn of a residence adjacent to the runway. Numerous broken tree limbs were strewn around the accident site. All flight control surfaces were accounted for at the site; there was no postimpact fire. An outboard section of the left wing, a section of the left wing's fuel line, the tail section, and the rudder separated from the airframe.

Examination of the airframe revealed that the composite fuselage sustained extensive fracturing. Both wing fuel tanks were breached, and a strong odor of jet fuel was present at the site. Flight control continuity was established from all major flight control surfaces to the cockpit. The landing gear was in the fully down and locked position and the flaps were fully extended. The fuel selector was in the left wing tank position. The electric elevator trim was tested and found in the full tab-down (nose-up) position. The aileron trim was broken from impact and the rudder trim was positioned in a neutral to slight nose-right position. Examination of the airplane revealed no mechanical anomalies that would have precluded normal operation.

The airplane was equipped with a Garmin G-1000 display. The unit's non-volatile memory card was not located, and no historical flight data was obtained.

The engine and the four-blade propeller assembly remained attached to the engine. Each blade was twisted toward the feathered position. Fuel was observed draining from the main fuel line when the engine was separated from the airframe. Visual examination of the engine revealed no mechanical issues that would have precluded normal operation.

The airplane was equipped with an Electronics International MVP-50 engine monitor. The unit sustained impact damage and the internal non-volatile memory card was not located; therefore, no historical engine data was obtained.

MEDICAL AND PATHOLOGICAL INFORMATION

The Office of the Medical Examiner, Daytona Beach, Florida, conducted an autopsy on the pilot. The cause of death was determined to be multiple blunt force injuries.

The FAA's Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing on specimens of the pilot. No carbon monoxide, cyanide, or ethanol was detected in the samples submitted for testing. Ibuprofen, a nonsteroidal anti-inflammatory drug that is not considered impairing, was detected in the pilot's urine.

ADDITIONAL INFORMATION

Air Traffic Control Information

According to FAA ORDER - JO 7110.65T, Section 4-7-10. APPROACH INFORMATION:

a. Both en route and terminal approach control sectors shall provide current approach information to aircraft destined to airports for which they provide approach control services.

This information shall be provided on initial contact or as soon as possible thereafter. Approach information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code. For pilots destined to an airport without ATIS, items 3-5 below may be omitted after the pilot advises receipt of the automated weather; otherwise, issue approach information by including the following:

1. Approach clearance or type approach to be expected if two or more approaches are published and the clearance limit does not indicate which will be used.
2. Runway if different from that to which the instrument approach is made.
3. Surface wind.
4. Ceiling and visibility if the reported ceiling at the airport of intended landing is below 1,000 feet or below the highest circling minimum, whichever is greater, or the visibility is less than 3 miles.
5. Altimeter setting for the airport of intended landing.

According to FAA ORDER- JO 7110.65W, Section 2-6-3. PIREP INFORMATION:

Significant PIREP information includes reports of strong frontal activity, squall lines, thunderstorms, light to severe icing, wind shear and turbulence (including clear air turbulence) of moderate or greater intensity, volcanic eruptions and volcanic ash clouds, detection of sulfur gases (SO₂ or H₂S) in the cabin, and other conditions pertinent to flight safety.

a. Solicit PIREPs when requested or when one of the following conditions exists or is forecast for your area of jurisdiction:

1. Ceilings at or below 5,000 feet. These PIREPs must include cloud base/top reports when feasible.

TERMINAL. Ensure that at least one descent/climbout PIREP, including cloud base/s, top/s, and other related phenomena, is obtained each hour.

EN ROUTE. When providing approach control services, the requirements stated in TERMINAL above apply.

2. Visibility (surface or aloft) at or less than 5 miles.
3. Thunderstorms and related phenomena.
4. Turbulence of moderate degree or greater.
5. Icing of light degree or greater.
6. Wind shear.
7. Volcanic ash clouds.

8. Detection of sulfur gases (SO₂ or H₂S), associated with volcanic activity, in the cabin.
 9. TERMINAL. Braking Action Advisories are in effect.
- b. Record with the PIREPs:
1. Time.
 2. Aircraft position.
 3. Type aircraft.
 4. Altitude.
 5. When the PIREP involves icing include:
 - a. Icing type and intensity.
 - b. Air temperature in which icing is occurring.
- c. Obtain PIREPs directly from the pilot, or if the PIREP has been requested by another facility, you may instruct the pilot to deliver it directly to that facility.
- d. Handle PIREPs as follows:
1. Relay pertinent PIREP information to concerned aircraft in a timely manner.
 2. EN ROUTE. Relay all operationally significant PIREPs to the facility weather coordinator.
 3. TERMINAL. Relay all operationally significant PIREPs to:
 - a. The appropriate intrafacility positions.
 - b. The FSS serving the area in which the report was obtained.
NOTE—The FSS is responsible for long line dissemination.
 - c. Other concerned terminal or en route ATC facilities, including non—FAA facilities.
 - d. Use the word gain and/or loss when describing to pilots the effects of wind shear on airspeed.

Minimum Descent Altitude

Per the FAA Instrument Flying Handbook (FAA-H-8083-16B), the minimum descent altitude (MDA) is "the lowest altitude, expressed in ft msl to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glideslope is provided.

Pilots are cautioned to fully understand and abide by the guidelines set forth in 14 *CFR* Part 91.175 Takeoff and Landing Under IFR, regarding proper identification of the runway and runway environment when electing to continue any approach beyond the published MDA.

91.175 states that no pilot may operate an aircraft (except military) below the authorized MDA unless:

- 1) The aircraft is continuously in a position from which a descent to landing on the intended runway can be made a normal rate of descent using normal maneuvers.
- 2) The flight visibility is not less than the visibility prescribed in the standard instrument approach being used.
- 3) Except for a Category II or Category III approach where any necessary visual reference requirements are specified by the FAA, at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:
 - (i) The approach light system, except that the pilot may not descend below 100 ft above the touchdown zone elevation using the approach lights as a reference unless the red terminating bars or the red side row bars are also distinctly visible and identifiable.
 - (ii) The threshold.
 - (iii) The threshold markings.
 - (iv) The threshold lights.
 - (v) The runway end identifier lights.
 - (vi) The visual glideslope indicator.
 - (vii) The touchdown zone or touchdown zone markings.
 - (viii) The touchdown zone lights.
 - (ix) The runway or runway markings.
 - (x) The runway lights.

Spatial Disorientation

According to the FAA Flight Training Handbook, Advisory Circular (AC) 61-21A, page 9:

The flight attitude of an airplane is generally determined by reference to the natural horizon. When the natural horizon is obscured, attitude can sometimes be maintained by reference to the surface below. If neither horizon nor surface references exist, the airplane's attitude must be determined by artificial means - an attitude indicator or other flight instruments. Sight, supported by other senses such as the inner ear and muscle sense, is used to maintain spatial orientation.

However, during periods of low visibility, the supporting senses sometimes conflict with what is seen. When this happens, a pilot is particularly vulnerable to spatial disorientation. Spatial disorientation to a pilot means simply the inability to tell "which way is up."

According to the FAA Instrument Flying Handbook, AC 61-27C (Section II, Instrument Flying: Coping with Illusions in Flight), an illusion or false impression occurs when information provided by sensory organs is misinterpreted or inadequate. Many illusions in flight could be created by complex motions and certain visual scenes encountered under adverse weather conditions and at night. It also stated that some illusions may lead to spatial disorientation or the inability to accurately determine the attitude or motion of the aircraft in relation to the earth's surface.

The AC further stated that the most hazardous illusions that lead to spatial disorientation are created by information received from motion sensing systems, which are located in each inner ear. The AC stated that these undesirable sensations cannot be completely prevented but that

they can be ignored or sufficiently suppressed by pilots' developing an "absolute" reliance upon what the flight instruments are reporting about the attitude of their aircraft.

History of Flight

Approach-IFR final approach	not used Other weather encounter
Approach-IFR missed approach	Loss of control in flight (Defining event) Aerodynamic stall/spin
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Private	Age:	67, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
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:	12/02/2016
Occupational Pilot:	No	Last Flight Review or Equivalent:	10/01/2016
Flight Time:	4246 hours (Total, all aircraft), 956 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	INDEPENDENT TECHNOLOGIES INC	Registration:	N669WR
Model/Series:	EPIC LT NO SERIES	Aircraft Category:	Airplane
Year of Manufacture:	2009	Amateur Built:	Yes
Airworthiness Certificate:	Experimental	Serial Number:	029
Landing Gear Type:	Retractable - Tricycle	Seats:	6
Date/Type of Last Inspection:	08/18/2016, Condition	Certified Max Gross Wt.:	7500 lbs
Time Since Last Inspection:		Engines:	1 Turbo Prop
Airframe Total Time:	822.31 Hours as of last inspection	Engine Manufacturer:	P&W CANADA
ELT:	C126 installed, activated, did not aid in locating accident	Engine Model/Series:	PT6A-67A
Registered Owner:	On file	Rated Power:	1200 hp
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument Conditions	Condition of Light:	Dusk
Observation Facility, Elevation:	7FL6, 24 ft msl	Distance from Accident Site:	
Observation Time:	1755 EST	Direction from Accident Site:	
Lowest Cloud Condition:		Visibility	2.5 Miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.18 inches Hg	Temperature/Dew Point:	19° C / 19° C
Precipitation and Obscuration:	No Precipitation		
Departure Point:	Millington, TN (NQA)	Type of Flight Plan Filed:	IFR
Destination:	Port Orange, FL (7FL6)	Type of Clearance:	IFR
Departure Time:	1558 EST	Type of Airspace:	Unknown

Airport Information

Airport:	SPRUCE CREEK (7FL6)	Runway Surface Type:	Asphalt
Airport Elevation:	24 ft	Runway Surface Condition:	Dry
Runway Used:	05	IFR Approach:	Global Positioning System; RNAV
Runway Length/Width:	4000 ft / 176 ft	VFR Approach/Landing:	Go Around; Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	1 Fatal	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	29.080278, -81.046667 (est)

Administrative Information

Investigator In Charge (IIC):	Leah D Read	Adopted Date:	07/16/2018
Additional Participating Persons:	Jay Davidson; FAA/FSDO; Orlando, FL		
Publish Date:	07/16/2018		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=94534		

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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