



# Aviation Investigation Final Report

<b>Location:</b>	Orange, Massachusetts	<b>Accident Number:</b>	ERA11FA102
<b>Date &amp; Time:</b>	January 1, 2011, 17:57 Local	<b>Registration:</b>	N6725X
<b>Aircraft:</b>	Cessna 310F	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Controlled flight into terr/obj (CFIT)	<b>Injuries:</b>	1 Fatal, 1 Minor
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The pilot and passenger were on a pleasure flight in the multi-engine airplane and at the last moment the pilot decided to conduct a touch-and-go landing and takeoff at a nearby airport. During a short final leg of the landing approach, the pilot recalled seeing white and red lights on the left side of the runway and believed these were visual approach slope indicator lights. He was uncertain of what light color arrangement indicated a proper glide path to the runway. As the airplane approached the runway, the lights started to flicker, at which time the pilot applied full engine power, but the airplane immediately collided with trees and came to rest inverted. The pilot stated that there was less ambient light than he had anticipated and that there was haze in the air. He was not aware of the trees at the approach end of the runway. The airport was not tower controlled and none of the 4 runways were equipped with visual approach slope indicator lights. The intended landing runway has a published displaced threshold that is 850 feet from the runway's original threshold. Published information cautions about trees at the approach end of that runway. The pilot did not review any publication for the intended airport before the flight. Additionally, the pilot did not hold a multi-engine rating or a multi-engine solo endorsement. The last entry in his flight logbooks for night flight was in 2000. The pilot reported no mechanical issues with the airplane before the accident.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot did not maintain separation from trees during landing. Contributing to the accident was the pilot's inadequate preflight planning and lack of recent night flight experience.

## Findings

<b>Personnel issues</b>	(general) - Pilot
<b>Personnel issues</b>	Recent experience - Pilot
<b>Environmental issues</b>	Low light - Effect on personnel
<b>Environmental issues</b>	Haze/smoke - Effect on personnel
<b>Personnel issues</b>	Qualification/certification - Pilot
<b>Personnel issues</b>	Flight planning/navigation - Pilot

# Factual Information

## History of Flight

Approach-VFR pattern final	Altitude deviation
Approach-VFR pattern final	Controlled flight into terr/obj (CFIT) (Defining event)

### HISTORY OF FLIGHT

On January 1, 2011, about 1757 eastern standard time, a Cessna 310F, N6725X, registered to and operated by an individual, crashed in a wooded area adjacent to the Orange Municipal Airport (ORE), Orange, Massachusetts, during a visual approach to runway 19. Visual meteorological conditions prevailed at the time. The personal flight was conducted under Title 14 of Federal Regulations Part 91, and no flight plan was filed. The airplane incurred substantial damage. The pilot received minor injuries and the passenger was killed. The flight departed from Dillant-Hopkins Airport (EEN), Keene, New Hampshire, earlier that day, about 1630,

A Massachusetts State Police representative (MSPR) stated that there were no eye witnesses to the accident. Residents near the airport, along the approach path to runway 19, reported hearing the airplane and noted from its sound that it was flying low compared to what they were accustomed to. Moments later they heard the crash. One witness ran toward the area where a person (the pilot) was yelling the passenger's name, the pilot instructed the witness to call 911.

The pilot stated to the MSPR that he became a pilot in 1989 and has about five hundred hours of flight experience. For a period of 6 to 7 years he stopped flying and resumed about a year ago with an instructor. He purchased the accident airplane around May or June of 2010. About 1630 he and the passenger departed from EEN and flew over Franklin County where the pilot is originally from. He had decided to practice a "touch and go" landing at ORE before returning to EEN; the pilot mentioned he had flown to ORE previously. When the pilot approached the airport there was less ambient light than he'd anticipated and there was a "haze" in the air; he also found the airplane to lose altitude faster than his previous airplane. He recalled seeing white and red lights off to the left near the runway, believing there were a visual slope indicator. He was uncertain of what arrangements indicate a proper glide path onto the runway. As the airplane approached the runway, the lights started to flicker, at which time he applied full engine power. He was unaware of the tree until after the crash and he was on the ground. He reported no mechanical issues with the airplane prior to the accident.

### PERSONNEL INFORMATION

The pilot, who was seated in the left seat, held a private pilot certificate with rating for airplane

single engine land. He did not hold a multiengine rating. He was issued a Federal Aviation Administration (FAA) third-class medical certificate on September 10, 2010, with limitations that he must wear correcting lenses for distant and possess glasses for near vision. He had documented 500 total hours at that time. A review of the pilot's flight logbook by FAA showed the pilot had about 50 hours of multi-engine instructional time. There was no multi-engine solo endorsement. The last entry for night time flight was in 2000.

The passenger, seated in the right seat, held no FAA certificates.

#### AIRCRAFT INFORMATION

The Cessna 310F, a 4 place all metal, low wing, multi-engine airplane, with retractable landing gear, serial number 310-0025, was manufactured in 1960, and issued a standard airworthiness certificate, in the normal category. The airplane was powered by 2 each Continental IO-470-D, 260-horsepower engine and equipped with Hartzell two bladed, variable-pitch, propellers.

The airplane's last annual inspection was February 1, 2010 and had a total of 5,416, hours at that time. The airplane's engines were last inspected on February 1, 2010. The airplane last had maintenance on September 4, 2010; addressing a FAA Condition Notice. At the time of the accident, the airplane had accumulated a total of 5,471 hours.

#### METEOROLOGICAL INFORMATION

The ORE 1752 METAR, was winds from 310 degrees at 3 knots; visibility, 9 statute miles; clear sky; temperature 02 degrees Celsius (C); dew point minus 1 degrees C; altimeter 30.00 inches of mercury.

The United States Naval Observatory Astronomical Applications Department recorded the phase of the Moon, on 1 January, 2010 for Orange, Massachusetts, as waning crescent with 8 percent of the Moon's visible disk illuminated. The Moon's position was recorded just above the horizon during the time of the accident. The sunset was at 1648 and the end civil twilight was 1658.

#### AIRPORT INFORMATION

Runway 19 at ORE is an asphalt, 5000 foot long by 75 foot wide, with a 850 feet displaced threshold, at an elevation of 533 feet mean sea level (msl). The airport does not have a control tower and none of the 4 runways are equipped with a visual slope indicator. Information cautioning trees at the approach end of runway 19 are published. The runway lighting system is controlled by the airport's common traffic frequency.

#### WRECKAGE AND IMPACT INFORMATION

The main wreckage came to rest at latitude 42 degrees, 34.604 minutes north and longitude

072 degrees, 17.407 minutes west, at an elevation of 536 feet msl; the nose of the airplane was on a heading of 080 degrees. The airplane's energy path was on a 200 degrees heading. The airplane initial contact was with a 70 foot tall tree, about 202 feet north from the main wreckage. The second contact was with a tree at a height about 55 feet above ground level (agl). The right aileron was located 125 feet north from the main wreckage. The third contact was with a thick tree at a height of 45 feet agl. Near that location a section of the right outboard wing was located on the ground. The fourth contact was with a thick tree at a height of 40 feet agl. The mid section of the right wing along with the right main landing gear, in the extended position, was located at the base of that tree.

Several trees were impacted thereafter along the energy path until the airplane's left forward inboard wing to fuselage area struck a large diameter tree about a height of 25 feet agl. The airplane lodge itself at that location. The tree broke over near the base, which resulted in the airplane impacting the ground, in a fresh water creek, inverted. The left out board wing section with the tip fuel tank was located 20 feet southeast of the main wreckage. The nose gear assembly was located the furthest from the initial tree contact, about 45 feet east of the main wreckage. The left engine came to rest about 5 feet from the main wreckage, left wing area. The right engine came to rest about 30 feet east of the main wreckage. The engines and the left outboard wing section came to rest across the creek on public property. The distant from the initial tree contact to the beginning of the displaced threshold was about 640 feet and 1,490 feet to the touch down zone of runway 19.

An on-scene wreckage examination showed all of the flight control surfaces and control cable continuity were accounted for. The right wing was the first to contact the trees separating, the tip tank, the wing section between the engine nacelle and tip tank and then separating the wing from outboard of the engine to the fuselage. The right aileron was observed separated from the wing and early in the wreckage path. The right fuel tip tank was observed stuck in the tree approximately 60 feet agl. The left wing was observed separated just outboard of the engine. There was an impact with a tree approximately, 12 inches in diameter, just outboard of the left side of the fuselage which severed the main spar.

Both horizontal stabilizer were observed to have impact damage from the trees approximately 6 inches inboard of the tip. Both control yokes were observed in the respective locations in the instrument panel and moved together. The rudder pedals moved when the rudder was moved by hand. The elevator cables in the tailcone were observed connected; impact damage to the forward fuselage prevented the control yokes from moving when the elevator was moved by hand.

The aileron cables were continuous from the cockpit to the left wing aileron bellcrank. The aileron cables for the right wing were not observed, due location of the wreckage and damage to the right wing. All four of the flap panels were observed extended. The flap actuator was not observed due to the position of the wreckage. The empennage flight control surfaces were observed attached to their respective aerodynamic surfaces. All three trim tabs were observed attached to their respective control surfaces. The trim tab actuator measurement for the

rudder was observed beyond the limits displacing the rudder tab to the right. The right aileron was observed separated from the wing. The left aileron was observed attached to the left wing.

Both front seats were observed separated from the seat pedestals and found outside the aircraft. The seat pedestal for the left front seat was observed distorted. The seat pedestal for the right front seat was observed with minor damage. The top forward section of the cabin area was crushed inward. The left side of the cabin area absorbed most of the impact. Both forward center attachment tabs for the front, left and right, lap seat belt systems were observed with their respective bolts ripped through the metal tab. The forward windshield was broken; remnants remained. Both of the rear seats remained attached to the fuselage. The left engine magneto switch was observed in the "Both" position. The right engine magneto switch was observed in the "Left" position. The left fuel selector was observed in the "Left Main" position. The right fuel selector was observed in between "Right Main" and "Right Aux" position. Engine control levers (throttles, propellers, and fuel mixtures) were observed in the full forward position. The altimeter setting was observed at 29.95 inches of mercury.

The left engine's number 2 cylinder's valve cover was observed with impact damage. Tree debris was observed in the area in between the engine cowling and top cylinders. Engine continuity was established by rotating the propeller and observing the alternator belt rotate. The fuel control assembly was intact. The fuel divider was observed with clean screen and fuel was present when opened. All top cylinder spark plugs were removed and observed with indication of the engine running rich. The left engine's propeller was attached at the engine crankshaft flange. The propeller hub was compromised by impact damage. Both blades were bent aft at mid span. One blade was observed in the low pitch and the other in the high pitch angle. No cord scoring was observed on the blades.

The right engine's number 1 cylinder valve cover was observed with impact damage. The oil sump pan was crushed. The fuel control assembly separated and was observed with impact damage. Engine continuity was established by rotating the propeller and observing the alternator belt rotate. The fuel engine driven fuel pump drive shaft was intact. The fuel divider's top screws were not properly safety wired. The fuel divider was observed with clean screen and fuel was present when opened. The top cylinder spark plugs were removed; unremarkable. The right engine's propeller was attached at the engine crankshaft flange. The propeller hub was unremarkable. One of the blades was observed with cord "S" twisting and bent aft, the other blade was bent aft at mid span. Erosion on the leading edge of the blades was observed. One blade was in the low pitch and the other in the high pitch angle.

## TEST AND RESEARCH

The airport's runway and taxiway lighting system was inspected and discovered one red lens cover separated from a light assembly for the left side threshold displacement lighting system for runway 19. There were no other discrepancies noted.

## MEDICAL AND PATHOLOGICAL INFORMATION

The Medical Examiner's Office in Holyoke, Massachusetts, conducted a postmortem examination of the passenger. The cause of death was blunt force trauma.

### Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	56, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	September 10, 2010
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	500 hours (Total, all aircraft), 50 hours (Total, this make and model)		

### Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N6725X
<b>Model/Series:</b>	310F	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	310-0025
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	February 1, 2010 Annual	<b>Certified Max Gross Wt.:</b>	4830 lbs
<b>Time Since Last Inspection:</b>	55 Hrs	<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	5416 Hrs as of last inspection	<b>Engine Manufacturer:</b>	CONT MOTOR
<b>ELT:</b>	C91A installed, not activated	<b>Engine Model/Series:</b>	IO-470 SERIES
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	260 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Night
<b>Observation Facility, Elevation:</b>	ORE, 555 ft msl	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	17:52 Local	<b>Direction from Accident Site:</b>	190°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	9 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	3 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	310°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30 inches Hg	<b>Temperature/Dew Point:</b>	2°C / 1°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Keene, NH (EEN )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Keene, NH (EEN )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	16:30 Local	<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	Orange Municipal Airport ORE	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	555 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	19	<b>IFR Approach:</b>	Visual
<b>Runway Length/Width:</b>	5000 ft / 75 ft	<b>VFR Approach/Landing:</b>	Traffic pattern

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Minor	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal, 1 Minor	<b>Latitude, Longitude:</b>	42.576667, -72.29(est)



## Administrative Information

<b>Investigator In Charge (IIC):</b>	Obregon, Jose
<b>Additional Participating Persons:</b>	Steven I Racicot; FAA/FSDO; Windsor Locks, CT Richard I Bunker; Massachusetts Department of Transportation; Boston, MA Andrew L Hall; Cessna Aircraft Company; Wichita, KS
<b>Original Publish Date:</b>	February 23, 2012
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB traveled to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=78081">https://data.nts.gov/Docket?ProjectID=78081</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).