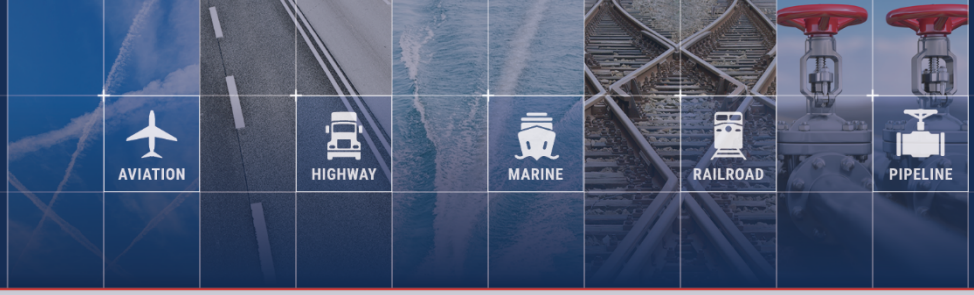

Aviation Investigation Final Report

Location:	Clayton, Oklahoma	**Accident Number:**	CEN14FA010
Date & Time:	October 18, 2013, 00:45 Local	**Registration:**	N30495
Aircraft:	Cessna 177	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation		

Analysis

During a night flight, about 12:45 am, the airplane impacted tall trees in mountainous terrain; the damage to the trees and witness marks on the airplane were consistent with a wings-level impact followed by a postimpact fire. Visual meteorological conditions prevailed and a full moon was 63 degrees above the horizon at the time of the accident. The pilot had been flying since 10:00 am the day before the accident and had been awake for at least 17 hours at the time of the accident. The pilot's wife reported that the pilot often kept late hours and had done so for the past 20 years. An examination of the airplane, engine, and related systems revealed no mechanical anomalies that would have precluded normal operation. Investigators were not able to determine why the airplane impacted mountainous terrain.

Probable Cause and Findings

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

Controlled flight into terrain for reasons that could not be determined from the available evidence.

Findings

Aircraft	Altitude - Not attained/maintained

Factual Information

History of Flight

Enroute	Controlled flight into terr/obj (CFIT) (Defining event)

On October 18, 2013, approximately 0045, a Cessna 177A, N30495, was substantially damaged when it collided with terrain west of Clayton, Oklahoma. A post impact fire ensued. The commercial pilot was fatally injured. The airplane was registered to Eagle Sky Patrol, Inc., and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed for the flight, which operated without a flight plan. The flight originated from Tahlequah Municipal Airport (KTQH), Tahlequah, Oklahoma, at 2349 and was en route to Terrell Municipal Airport (KTRL), Terrell, Texas.

According to the family, the pilot had departed KTRL, approximately 1000, on October 17, 2013, and flew to Eldorado, Kansas, to pick up the accident airplane. The pilot then flew the accident airplane to New Century, Kansas, and Davenport, Iowa, to look at other airplanes. While en route to KTRL, the pilot stopped for fuel at KTQH.

According to video obtained from a security camera at KTQH, the accident airplane entered the range of the camera and taxied up to the fuel pumps at 2333. The pilot got out of the airplane at 2334, positioned a ladder near the left wing, and then walked away from the fuel pumps and the airplane. The pilot walked back towards the airplane at 2338 and fueled a fuel tank on the left side of the airplane. The pilot took actions consistent with a preflight inspection and then boarded the airplane at 2346. At 2349, the accident airplane departed KTQH.

The airplane was reported overdue by a concerned family member on the morning of October 18 and an alert notification (ALNOT) for a missing airplane was issued by the Federal Aviation Administration (FAA). The wreckage of the missing airplane was located on the afternoon of October 18, 2013.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	54
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	June 1, 2013
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	December 5, 2012
Flight Time:	(Estimated) 22130 hours (Total, all aircraft), 0 hours (Total, this make and model)		

The pilot, age 54, held a commercial pilot certificate with an airplane single and multiengine land rating. He also held a flight instructor certificate with an airplane single engine land rating and an airframe and powerplant certificate. He was issued a second class airman medical certificate on June 4, 2013. The certificate contained the limitation "Must have available glasses for near vision."

The family of the pilot provided a scanned copy of the last two pages of the pilot's logbook. The two pages reflected flights logged between November 18, 2012, and November 23, 2012. The total flight time to date in the pilot's logbook was 21,762.6 hours. The pilot's night flight experience was not shown on the logbook pages provided. The family estimated that he had flown no less than 375 hours during 2013. At the time the pilot applied for his medical certificate, he reported he had logged 21,820 hours of flight time. Investigators estimated that the pilot had no less than 22,130 total flight hours.

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N30495
Model/Series:	177 A	**Aircraft Category:**	Airplane
Year of Manufacture:	1968	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17701288
Landing Gear Type:	Tricycle	**Seats:**	
Date/Type of Last Inspection:	October 30, 2012 Annual	**Certified Max Gross Wt.:**	2348 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	5864 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:		**Engine Model/Series:**	O 360-A2F
Registered Owner:	EAGLE SKY PATROL INC	**Rated Power:**	180 Horsepower
Operator:	EAGLE SKY PATROL INC	**Operating Certificate(s) Held:**	None

The accident airplane, a Cessna 177A (serial number 17701288), was manufactured in 1968. It was registered with the FAA on a standard airworthiness certificate for normal operations. A Lycoming O-360-A2F engine rated at 180 horsepower at 2,700 rpm powered the airplane. The engine was equipped with a 2-blade, McCauley propeller.

The airplane was registered to and operated by Eagle Sky Patrol, Inc., and was maintained under an annual inspection program. A review of the maintenance records indicated that an annual inspection had been completed on October 30, 2012, at an airframe total time of 5,864 hours, and a tachometer time of 2,344.0. The engine was serviced with 8 quarts of oil on September 26, 2013, at a tachometer time of 2,870.39.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	KMLC,771 ft msl	**Distance from Accident Site:**	23 Nautical Miles
Observation Time:	23:53 Local	**Direction from Accident Site:**	315°
Lowest Cloud Condition:	Few / 7000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.03 inches Hg	**Temperature/Dew Point:**	8°C / 7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tahlequah, OK (KTQH)	**Type of Flight Plan Filed:**	None
Destination:	Terrell, TX (KTRL)	**Type of Clearance:**	None
Departure Time:	23:49 Local	**Type of Airspace:**	

The closest National Weather Service weather reporting location to the accident site was McAlester Regional Airport (KMLC), McAlester, Oklahoma, located 23 miles northwest of the accident site at an elevation of 771 feet. KMLC weather at 2353 report wind, visibility 10 statute miles, a few clouds at 7,000 feet agl, scattered at 9,000 feet, temperature 8° Celsius (C), dew point 7° C, altimeter 30.03 inches of mercury.

According to the United States Naval Observatory, Astronomical Applications Department Sun and Moon Data, the sunset was recorded at 1844 and the end of civil twilight was 1909. At the time of the accident the Sun was more than 15° below the horizon, with a full moon at 63° above the horizon at an azimuth of 180°.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	34.583057,-95.500274(est)

The accident site was characterized by mountainous terrain and was vegetated by tall deciduous and coniferous trees. The first identified point of contact was at the tops of several coniferous trees to the north and downhill from the main wreckage. The angle of damage at the top of the trees was consistent with wings level flight path. The tops of multiple trees were broken in the direction of the impact. Paint chips, torn and fragmented metal, fragmented Plexiglas, and broken tree branches extended from the

point of impact to the main wreckage.

The left wing separated from the airplane and came to rest in a tree 30 feet south of the initial impact point. The left wing included the left aileron and left flap. The flight controls were continuous from aileron inboard towards the wing root. The separation point on the flight control cable was consistent with overload. The inboard portion of the wing separated and was located just east of the main wreckage. The main wreckage included the fuselage, engine, right wing, and empennage.

The empennage included the rudder, stabilator, and vertical stabilizer. The rudder controls were continuous from the cabin aft to the rudder. The stabilator cables were continuous from stabilator forward to the cabin. The vertical stabilizer separated and was located just aft of the main wreckage. The left stabilator exhibited circular crushing along the leading edge, exposure to heat and fire, and the outboard portion separated and was impact and fire damaged. The right horizontal stabilator exhibited heat and impact damage.

The right wing included the right flap and right aileron. The inboard portion of the right wing remained attached. The outboard portion of the right wing separated partially and came to rest beneath the inboard portion of the right wing. The right aileron cables were continuous from the aileron control surface inboard to the cabin.

The fuselage included the cabin and instrument panel. The fuselage exhibited impact damage and was charred, melted, and partially consumed by fire. The instrument panel was impact damage and several instruments were located forward of the main wreckage in the burn field.

HSI - 260 degrees
Airspeed - 145 mph
Altimeter - 3,830 feet
Kollsman - 29.99

The flap actuator was fully extended consistent with a flaps-up position. The fuel selector valve was charred, melted, and partially consumed by fire. The valve was in a position consistent with a left tank selection.

The engine separated from the airframe, aft of the firewall, and came to rest on a tree uphill and adjacent to the main wreckage. The engine assembly included the two-blade, fixed-pitch, McCauley propeller. The cowling was charred, melted, and partially consumed by fire. The engine exhibited impact and fire damage.

The propeller blades were identified as blade 1 and blade 2 per manufacture's identification procedures. Blade 1 was bent aft 90 degrees and twisted and exhibited impact, heat, and fire damage. Blade 2 was bowed aft and exhibited impact, heat, and fire damage. The face of both propeller blades exhibited chordwise scratching and leading edge scoring.

The top bank of sparkplugs was removed and exhibited signatures consistent with normal combustion when compared to the Champion spark plug chart. The head of the number 4 cylinder had separated, consistent with impact damage. The engine was rotated through by hand at the propeller. Cylinder

compression was observed on cylinders one through three. Compression on cylinder 4 could not be verified due to impact damage. The magnetos were damaged by fire and could not be functionally tested. An examination of the starter and vacuum pump exhibited impact and fire damage and signatures consistent with rotation at the time of impact.

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

Medical and Pathological Information

The autopsy was performed by the Office of the Chief Medical Examiner, Tulsa, Oklahoma, on October 21, 2013. The autopsy concluded that the cause of death was multiple blunt force injuries and the report listed the specific injuries.

The FAA's Civil Aerospace Medical Institute, Oklahoma City, Oklahoma, performed toxicological tests on specimens that were collected during the autopsy (CAMI Reference #201300210001). Tests for carbon monoxide and cyanide were not performed. Results were negative for volatiles and drugs.

Tests and Research

The altimeter was examined at United Instruments, under the auspices of an FAA inspector. Due to the impact and fire damage, the unit could not be functionally tested. However, the damage to the unit was consistent with impact.

Additional Information

According to the pilot's wife, the pilot got up around 0730 on the morning of October 17, 2013. The pilot started flying around 1000 that morning and flew to Eldorado, Kansas, to pick up the accident airplane. The pilot flew from Eldorado, Kansas, to New Century, Kansas, to look at an airplane. The pilot then flew from Eldorado, Kansas, to Davenport, Iowa, to look at another airplane. The pilot contacted his family at 1845 and indicated that he was en route to TRL and planned to stop for fuel.

The pilot's wife reported that this type of flying was not unusual for the pilot and he often kept late hours. She further reported that he habitually kept late hours for the past 20 years.

Administrative Information

Investigator In Charge (IIC):	Rodi, Jennifer
Additional Participating Persons:	Rakesh P Patel; FAA Flight Standards District Office; Oklahoma City, OK Andrew L Hall; Cessna Aircraft; Wichita, KS John Butler; Lycoming Engines; PA
Original Publish Date:	October 30, 2014
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Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=88237