



# Aviation Investigation Final Report

<b>Location:</b>	Corning, New York	<b>Accident Number:</b>	ERA13LA057
<b>Date &amp; Time:</b>	November 15, 2012, 12:11 Local	<b>Registration:</b>	N369AW
<b>Aircraft:</b>	Hughes 369D	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Low altitude operation/event	<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Aerial observation		

## Analysis

The helicopter was flying west down a hill over power lines that the pilot was inspecting when it struck the top of the power lines that were perpendicular to its flightpath. The tail rotor assembly separated, and the helicopter impacted the ground and came to rest inverted. Postaccident examination of the helicopter did not reveal any preimpact mechanical malfunctions that would have precluded normal operation; however, most of the wreckage sustained extensive thermal- and impact-related damage.

The pilot was hired about 3 weeks before the accident. He had no prior power line patrol experience, but he had completed a wire strike avoidance training module about 2 weeks before the accident. The accident occurred during the pilot's second work day of flying power line observation flights. After the accident, the operator instituted a policy requiring that all newly hired pilots obtain 100 flight hours of power line patrol-related flight experience with company crewmembers before being assigned an operation that would require flying with noncompany observers.

## 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 adequate altitude while conducting a power line aerial observation flight, which resulted in an in-flight collision with wires. Contributing to the accident was the pilot's lack of total experience in the type of operation.

## Findings

<b>Aircraft</b>	Altitude - Not attained/maintained
<b>Personnel issues</b>	Aircraft control - Pilot
<b>Personnel issues</b>	Total experience - Pilot
<b>Environmental issues</b>	Wire - Not specified

# Factual Information

## History of Flight

<b>Maneuvering-low-alt flying</b>	Low altitude operation/event (Defining event)
<b>Maneuvering-low-alt flying</b>	Collision with terr/obj (non-CFIT)
<b>Uncontrolled descent</b>	Collision with terr/obj (non-CFIT)

On November 15, 2012, at 1211 eastern standard time, a Hughes 369D, N369AW, operated by Haverfield Aviation Inc., was substantially damaged following a collision with power lines and terrain in Corning, New York. The commercial pilot and the observer were fatally injured. Visual meteorological conditions prevailed and no flight plan had been filed for the flight that departed the Elmira-Corning Regional Airport (ELM), Horseheads, New York, about 1145. The aerial observation flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

The observer was a utility company employee.

According to the operator, the helicopter was temporarily based at the Tri-Cities Airport (CZG) in Endicott, New York, and was being utilized to inspect the power lines after a recent storm. The helicopter conducted an uneventful flight earlier in the day and was subsequently refueled at ELM, before continuing survey operations.

Witnesses observed the helicopter flying west, down a hill over power lines which extended east to west. One witness stated that the helicopter appeared below the highest tower, shortly before it struck the top of power lines that extended to the south, perpendicular to the helicopter's flight path. The witness further stated that he did not hear any changes in the rhythm of the rotor blades prior to the impact.

The tail rotor assembly separated, the helicopter impacted the ground and came to rest inverted. A postcrash fire consumed a majority of the main wreckage. On site examination of the helicopter was performed by a Federal Aviation Administration (FAA) inspector, who noted power lines wrapped around the main rotor assembly. In addition, the power company reported two power lines "tripped out" at 1211.

A handheld Garmin GPSMAP 496 global positioning system receiver was recovered from the accident site and forwarded to the NTSB Vehicle Recorders Laboratory, Washington, DC for data download.

## Pilot Information

<b>Certificate:</b>	Commercial; Flight instructor	<b>Age:</b>	24
<b>Airplane Rating(s):</b>	None	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	Helicopter	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Helicopter	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	March 27, 2012
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated) 1633 hours (Total, all aircraft), 10 hours (Total, this make and model), 10 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

The pilot, age 24, held a commercial pilot certificate, with ratings for rotorcraft and instrument helicopter. He also held a rotorcraft flight instructor certificate. His most recent FAA second-class medical certificate was issued on March 27, 2012. At that time, he reported a total flight experience of 1,350 hours, which included 30 hours during the previous 6 months. His most recent flight review was conducted on November 8, 2012, in the same make and model as the accident helicopter.

According to company records, the pilot was hired by Haverfield Aviation on October 22, 2012. He had no prior power line patrol experience and completed a "Helicopter Accident Reduction – Wire Strike Avoidance" training module on October 28, 2012. At the time of the accident, the pilot had accumulated about 1,635 hours of total flight experience, which included about 10 hours in the same make and model as the accident helicopter, of which 5.2 hours were accumulated during the 24 hours that preceded the accident.

The accident occurred during the pilot's second work day of flying power line aerial observation flights.

According to a company representative, after the accident, Haverfield Aviation instituted a policy requiring that all new hire pilots obtain 100 flight hours of power line patrol related flight experience with company crewmembers prior to being assigned an operation that would require flying with non-company observers.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Hughes	<b>Registration:</b>	N369AW
<b>Model/Series:</b>	369D	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>	1977	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	470117D
<b>Landing Gear Type:</b>	High skid	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	October 19, 2012 100 hour	<b>Certified Max Gross Wt.:</b>	3000 lbs
<b>Time Since Last Inspection:</b>	73 Hrs	<b>Engines:</b>	1 Turbo shaft
<b>Airframe Total Time:</b>	21918 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Allison
<b>ELT:</b>	C126 installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	M250-C20B
<b>Registered Owner:</b>	Haverfield International Inc.	<b>Rated Power:</b>	420 Horsepower
<b>Operator:</b>	Haverfield International Inc.	<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>	Haverfield Aviation, Inc.	<b>Operator Designator Code:</b>	HXFA

The four-place helicopter, serial number 470117D, was manufactured in 1977, and was primarily constructed of aluminum alloy. The main rotor was a fully articulated five-bladed system, with anti-torque provided by a two-bladed semi-rigid type tail rotor. It was powered by an Allison M250-C20B, serial number CAE-836392, turboshaft engine, with a takeoff power rating of 420-shaft horsepower.

The helicopter was equipped in a standard left side single pilot configuration. It was also equipped with a wire strike cutting system on the top and bottom portions of the fuselage. The operator reported that the helicopter's most recent 100-hour inspection was performed on October 19, 2012. At that time, the helicopter had been operated for 21,918 total hours. The helicopter had been operated for about 75 hours since the inspection. The engine was manufactured on May 5, 1989, and had been operated for about 12,500 hours since new.

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	ELM,954 ft msl	<b>Distance from Accident Site:</b>	8 Nautical Miles
<b>Observation Time:</b>	11:53 Local	<b>Direction from Accident Site:</b>	85°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	/	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.37 inches Hg	<b>Temperature/Dew Point:</b>	3°C / -2°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Horseheads, NY (ELM )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Horseheads, NY (ELM )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	11:45 Local	<b>Type of Airspace:</b>	

The reported weather at ELM, which was located about 8 miles east of the accident site, at an elevation 955 feet mean sea level, at 1153, was: clear skies; visibility 10 statute miles; wind calm; temperature 3 degrees Celsius (C); dew point -2 degrees C; altimeter 30.37 inches of mercury.

## Airport Information

<b>Airport:</b>	ELMIRA/CORNING RGNL ELM	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	954 ft msl	<b>Runway Surface Condition:</b>	
<b>Runway Used:</b>		<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Fatal	<b>Aircraft Fire:</b>	On-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Fatal	<b>Latitude, Longitude:</b>	42.147499,-77.041946

Examination of the helicopter after recovery did not reveal any preimpact malfunctions that would have precluded normal operation; however, the wreckage, with the exception of the tail boom and tail rotor assembly sustained extensive thermal and impact related damage.

Evidence of wire contact marks were observed on the main rotor blades, tail rotor blades, tail empennage, and the landing gear skid assembly. The helicopter's wire strike system showed no evidence of wire contact.

All observed main rotor blades contained bent and/or broken spars, wrinkled and punctured skin, and varying degrees of trailing edge separation. The white, blue, and yellow blades were separated from the hub at their respective pitch change housings. The green blade was fractured outboard of Blade Station 105 and the outboard section was not recovered. The red blade was fractured just outboard of the root fitting doubler. A majority of the blue blade was not recovered; although a 12 inch section of trailing edge was located from the vicinity of Blades Station 45.

Continuity of the drivetrain system could not be established due to impact and fire damage. The main transmission was intact. The output drive gear, transmission input pinion assembly and the tail rotor output pinion assembly rotated freely when manipulated by hand. The upper transmission magnetic chip detector plug was absent of metallic debris. The lower transmission magnetic chip detector plug was not located.

The tail rotor driveshaft separated into four main sections, which corresponded with the position and length of fractures observed on the tail boom. The tail boom damage was consistent with main rotor blade contact. The tail rotor gearbox, rotor blades, and pitch control assemblies sustained minor damage and could be manipulated normally.

The engine was entangled in airframe structure and wiring. Extraction of the engine revealed extensive postcrash fire damage. Neither the N1 nor the N2 drive trains could be manually rotated. The accessory gearbox, including both chip detectors was consumed by fire. The compressor remained in its normal position. The first stage axial blades exhibited nicking of multiple leading edge surfaces with deflection of several leading edge surfaces bent opposite the direction of blade rotation. The No. 1 turbine wheel was ashen coated, but otherwise normal in appearance. The fuel pump displayed evidence of thermal exposure with melting of the body and fuel pump bowl, which exposed the fuel filter. Both the power turbine governor and fuel control units were destroyed by fire damage.

## **Medical and Pathological Information**

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An autopsy was performed on the pilot by the Office of the Medical Examiner, Monroe County, New York. The autopsy report revealed the cause of death as "multiple blunt force injuries."

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma was negative for tested substances.

## Additional Information

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### GPS Data

The Garmin GPSMAP 496 was successfully downloaded by the NTSB Vehicle Recorders Laboratory.

According to the recorded data, the helicopter departed ELM to the northwest at 1147:56, and then proceeded on a southwesterly heading for about 4 miles. The helicopter flew south over interstate 86, then turned back north and proceeded northeasterly, before proceeding about 1.5 nautical miles northwesterly, and then returning southeasterly along the same route. By about 12:07:10, the helicopter was proceeding westerly, north of interstate 86. From 1210:11 until about 1210:44, the helicopter flew northeasterly along the top of a ridgeline. About 1210:44, the helicopter proceeded southwesterly, crossing interstate 86 about 1211:12 at a GPS recorded altitude of 1,237 feet, and a ground speed of 36 knots. At 1211:27, the helicopter was in the vicinity of the wires that were struck at the accident site, and was flying at GPS recorded altitude of 1,014 feet, a ground speed of 43 knots, and a heading of 240 degrees. The last two recorded points were both at a GPS recorded altitude of 1,010 feet, at 1211:34 and 1211:57. The point recorded at 1211:34, was at a heading of 245 degrees and a ground speed of 11 knots. The last point was recorded on a heading of 33 degrees and a ground speed of 1 knot.



## Administrative Information

**Investigator In Charge (IIC):** Schiada, Luke

**Additional Participating Persons:** Norman Tessier; FAA/FSDO; Rochester, NY  
Robert Bohner; Haverfield Aviation; Gettysburg, PA  
John Hobby; MD Helicopters; Mesa, AZ  
Adrian Booth; Boeing Helicopters; Mesa, AZ

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**Investigation Class:** [Class](#)

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=85595>

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