Aviation Investigation Final Report

Location:	Asotin, Washington	**Accident Number:**	WPR15FA204
Date & Time:	July 1, 2015, 10:00 Local	**Registration:**	N9490F
Aircraft:	Hughes 269C	**Aircraft Damage:**	Destroyed
Defining Event:	Low altitude operation/event	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

This report was modified on September 30, 2016. Please refer to the public docket for this accident to view the original report.

The private pilot and passenger were on a local area flight. While maneuvering in a canyon, the helicopter impacted power lines and descended to the canyon's wall. A fire ensued and burned the surrounding area. The power lines were located 350 ft south of the wreckage with two 35-ft support structures (wood poles) on either side of the canyon about 1,452 ft apart. The two 5/16-inch diameter power lines were oriented east-west and ran horizontally parallel to one another.

Ground scar analysis and wreckage fragmentation revealed that the helicopter contacted the power lines in the area of the swashplate. According to the helicopter manufacturer, if the helicopter were in level flight at cruise speed, 0.11 seconds would transpire between the contact with the first wire (canopy) and the second wire (slat and mast). Given the damage and rub marks, it is likely that, after the second wire impact, the helicopter pitched up and yawed left. Examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

The private pilot had about 55 hours total time, most of which was accumulated around the accident area.

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 clearance from power lines while maneuvering in a

canyon.

Findings

Environmental issues	Wire - Awareness of condition
Personnel issues	Monitoring environment - Pilot
Aircraft	Altitude - Not attained/maintained

Factual Information

History of Flight

Maneuvering-low-alt flying	Collision with terr/obj (non-CFIT)
Maneuvering-low-alt flying	Low altitude operation/event (Defining event)

HISTORY OF FLIGHT

This report was modified on September 30, 2016. Please refer to the public docket for this accident to view the original report.

On July 01, 2015, about 1000 Pacific daylight time, a Hughes 269C, N9490F, collided with powerlines while flying in a canyon in the vicinity of Asotin, Washington. Following the collision, the helicopter was consumed by fire and destroyed. The pilot was operating the helicopter under the provisions of 14 Code of Federal Regulations Part 91. The pilot and passenger were fatally injured. The personal local flight originated from the Lewiston-Nez Perce County Airport, Lewiston, Idaho about 0930. Visual meteorological conditions prevailed, and a flight plan had not been filed.

The pilot communicated with his father earlier in the morning telling him that he was planning on flying the helicopter around 0930 with the passenger, his cousin. Several people in the area of the accident reported observing a helicopter flying in an adjacent canyon. A fire was reported just before 1000, and during the suppression efforts a firefighter discovered the wreckage. The postimpact fire spread predominately south consuming numerous acres of the canyon terrain and fields. Following the accident, a Clear Water Power Co. employee reported that there had been a temporary disruption of service in the powerline.

PERSONNEL INFORMATION

The pilot, age 17, held a private pilot certificate issued in December 2014, with a rating for rotorcraft-helicopters. He held a third-class airman medical certificate issued in December 2013, with no limitations.

According to the pilot's personal flight logbook, he had amassed 55.5 hours total time, all of which was in rotorcraft, and all in relatively the same make and model as the accident helicopter. He had accumulated about 22 hours in the capacity of pilot-in-command. Based on the airport identifiers listed in the logbook for flight origin and destination points, the pilot accumulated a majority of his flying hours around the Lewiston area.

AIRCRAFT INFORMATION

The accident helicopter, a Hughes 269C, serial number 1030243, was manufactured in 1973. According to maintenance records, the airframe had accumulated a total time in service of about 12,725 hours. The most recent annual inspection was signed by a mechanic, as completed in February 2015. The

maintenance records disclosed that the Lycoming HIO-360-D1A engine underwent an annual inspection on the same date at an engine total time of about 435 hours.

METEOROLOGICAL

A routine aviation weather report (METAR) for the Lewiston-Nez Perce County Airport was issued a few minutes before the accident. It stated: sky clear; visibility 10 miles; wind calm; temperature 86 degrees Fahrenheit; dew point 50 degrees Fahrenheit; and altimeter 29.98 inHg.

WRECKAGE AND IMPACT INFORMATION

The accident site was located in a small canyon, Ayres Gulch Canyon, which is about 6 nautical miles in length, and oriented north-south, with the accident site located midway. The canyon was one of a series of canyons. It was surrounded by wheat fields and a large barn, which was located about 1.7 nm south of the accident site. The elevation at the accident site was about 2,225 feet mean seal level (msl), with the surrounding hills about 2,660 feet msl. The main wreckage, which consisted of the fuselage and engine, came to rest on a flat dirt area on the east wall of the canyon.

Powerlines were located 350 ft south of the wreckage with two 35-foot support structures (wood poles) on either side of the canyon, a distance of 1,452 ft apart. The two 5/16-inch diameter guy wires were oriented east-west and ran horizontally parallel to one another. There were powerlines that additionally ran north-south bordering the west canyon wall.

Located under the powerlines was a portion of the canopy frame, which consisted of the mid-left horizontal portion and the center vertical portion. On the vertical portion of the frame there was a bend which would have been oriented directly where the top of the panel was situated in the cockpit. There were additionally red rub marks found on the frame, consistent with contact of the tail rotor blades. A portion of the mid-right horizontal canopy was located near that area. There were numerous pieces of shaded (tinted) and clear plexiglass observed around the area. The headset holder, portions of the upper canopy slat, frames of both headsets, and the upper tail boom light-clip were located on the hill in between the wires and the main wreckage.

A detailed wreckage and impact report with accompanying pictures is contained in the public docket for this accident.

MEDICAL AND PATHOLOGICAL

The Spokane County Office of the Medical Examiner performed an autopsy on the pilot and passenger. The FAA Toxicology Accident Research Laboratory, Oklahoma City, Oklahoma, performed toxicological testing; the findings were positive for ethanol (alcohol). The toxicology report additionally noted evidence of putrefaction in the specimens received.

TESTS AND RESEARCH

The wreckage had sustained significant thermal damage. Examination of the airframe revealed that most of the control push-pull tubes and fuselage structure were consumed by fire, with thermally damaged remnants of the bellcranks, cyclic, collective, and anti torque pedals remaining.

Both the right and left skids were separated near midspan. The drag strut signatures, coupled with the forward skid fractures on both sides, is consistent with the helicopter in forward motion at the time of impact. The toes of the skids were oriented to be the first contact, which would result in the skid deforming upward and placing a concentrated load on the forward support strut below the damper. The drag struts were relatively straight with little bending, and primarily exhibited crushing from contacting the frame at the forward end. The bowed deformation and numerous fractures of the main frame steel tubing was consistent with a nose-down vertical attitude.

The stationary scissors link which holds the non-rotating portion of the swashplate was fractured. The blue main rotor blade exhibited a significant amount of arcing spatter on its bottom inboard end surface; the other two blades had minor amounts of arcing splatter. The rotating scissors links were intact and remained attached to the swashplate and the lug portion of the scissors support. Given orientation of the damage, it is likely that the powerlines made contact with the helicopter in the area of the swashplate with electrical arcing and mechanically contacted and fractured the stationary scissors and non-rotating swashplate.

The tail boom came to rest in front of the helicopter cabin. The tail rotor assembly was resting in the dirt with the blue main rotor blade's leading edge position near the vertical fin. The tail boom exhibited a fracture just aft of the vertical fin attachment on the left side; there were no main rotor blade strike indications on the boom. There was a red rub mark indent located on the tail, consistent and oriented with the tail rotor blades coming into contact with the boom while in rotation. The vertical fin exhibited signatures of a main rotor blade strike on the right side of the boom, consistent with a blade contacting the right side of the vertical fin after the boom was on the ground, with enough energy to fracture the boom tube at the vertical fin attach area.

The tail rotor blades exhibited arcing marks, as did the horizontal stabilizer. The horizontal stabilizer also exhibited bending of the forward inboard sheet metal and spar. It is likely that the electrical transmission wires contacted the tail rotor blades and stabilizer.

According to the helicopter manufacturer, if in level flight, the helicopter is about 18° nose-down (depending on airspeed). Given this scenario, the manufacturer furth stated, that with the accident conditions (estimating the wires were spaced about 6 feet apart), the angle would orient both the wires on top of each other at cabin impact. Assuming the helicopter was maneuvering at 60 mph, 0.11 seconds would transpire between the contact with the first wire (canopy) and the second wire (slat and mast). Given the damage and rub marks, it is likely that after the second wire impact, the helicopter likely pitched up and yawed to the left (wire impact on right side of mast). There was contact at the horizontal stabilizer where the helicopter likely exited the wires and continued in a right rotation with the nose-low descent. The tail boom was likely partially separated at the wire contact.

Examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation. A detailed examination report is contained in the public docket for this accident.

Pilot Information

Certificate:	Private	**Age:**	17,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	5-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	December 3, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	December 6, 2014
Flight Time:	(Estimated) 55 hours (Total, all aircraft), 55 hours (Total, this make and model), 22 hours (Pilot In Command, all aircraft), 4 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Hughes	**Registration:**	N9490F
Model/Series:	269C	**Aircraft Category:**	Helicopter
Year of Manufacture:	1973	**Amateur Built:**	
Airworthiness Certificate:	Normal; Restricted (Special)	**Serial Number:**	1030243
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	February 16, 2015 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	12733.4 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	HIO-360-D1A
Registered Owner:	On file	**Rated Power:**	180 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	Agricultural aircraft (137)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KLWS,1436 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	16:56 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.97 inches Hg	**Temperature/Dew Point:**	30°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lewiston, ID (KLWS)	**Type of Flight Plan Filed:**	None
Destination:	Lewiston, ID (KLWS)	**Type of Clearance:**	None
Departure Time:	09:30 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	46.2425,-117.081108

Administrative Information

Investigator In Charge (IIC):	Keliher, Zoe
Additional Participating Persons:	Christopher Cowgill; Federal Aviation Administration; Spokane, WA Steven Gleason; Sikorsky; Stratford, CT
Original Publish Date:	July 12, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=91480