Aviation Investigation Final Report

Location:	Dennis, West Virginia	**Accident Number:**	ERA17LA209
Date & Time:	June 23, 2017, 13:15 Local	**Registration:**	N765KV
Aircraft:	Hughes 369	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	Part 133: Rotorcraft ext. load		

Analysis

The commercial pilot was conducting long line operations in the helicopter, and he was flying it in an aft or left attitude with a higher nose-up attitude than normal flight to compensate for the load's drag. He then transitioned the helicopter to a 100-ft hover over a landing zone, and shortly thereafter, the helicopter experienced a total loss of engine power. Subsequently, the pilot initiated an autorotation, and during the landing, a main rotor blade contacted and severed the tailboom.

Postaccident wreckage examination, which included a successful test-run of the engine, did not reveal evidence of any preimpact mechanical malfunctions or failures that would have precluded normal operation. However, when the helicopter was positioned nose up with the remaining fuel onboard (about 7 gallons in each tank), the low fuel light illuminated. The two fuel tanks were connected by an interconnect passage, and each tank had an internal baffle. The fuel pickup was located in the right front portion of the left fuel tank. Given that the low fuel light illuminated when the helicopter was positioned nose up, it is likely that the helicopter's nose-up attitude during the long line operation led to the unporting of the remaining fuel, which resulted in fuel starvation.

The operator's risk assessment form required that pilots land the helicopter with at least about 14.7 gallons of fuel remaining for long line operations. After the accident, the operator amended its risk assessment form to require the same fuel requirement as side pull operations (about 37 gallons of fuel remaining upon landing) for long line operations.

Probable Cause and Findings

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

The unporting of fuel due to the helicopter's nose-up attitude during long line operations, which resulted in fuel starvation and a total loss of engine power.

Findings

Aircraft	(general) - Not specified

Factual Information

History of Flight

Maneuvering	Fuel starvation
Maneuvering-hover	Loss of engine power (total) (Defining event)
Autorotation	Hard landing
Landing	Part(s) separation from AC

On June 23, 2017, about 1315 eastern daylight time, a Hughes 369E, N765KV, operated by Haverfield Aviation Inc, was substantially damaged during a hard landing near Dennis, West Virginia. The commercial pilot was not injured. The external load flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 133. Visual meteorological conditions prevailed and no flight plan was filed for the local flight.

The pilot reported that he returned to the landing zone with a conductor attached to a long line. The helicopter was in a 100-foot hover over the landing zone, while the pilot monitored a ground crewmember tasked to disconnect the conductor from the long line. The helicopter began to settle and the pilot raised the collective control; however, the helicopter continued to settle as a warning horn sounded and the engine noise ceased. The pilot then entered an autorotation and during the landing, a main rotor blade contacted the tailboom, which resulted in a tailboom separation.

The pilot added that prior to the hover, he was pulling the conductor with the helicopter in an aft or left attitude. He estimated that the loss of engine power occurred 45 seconds to 1 minute after transitioning from the pull to a hover.

A Federal Aviation Administration (FAA) inspector witnessed a subsequent wreckage examination, which included a successful test-run of the engine. No preimpact mechanical malfunctions were noted and the low fuel light illuminated when the helicopter was positioned nose-up with the remaining fuel onboard. The inspector added that approximately 7 gallons of fuel remained in each of the two fuel tanks at the time of the loss of engine power. The two fuel tanks were connected by an interconnect passage and each tank had an internal baffle. The fuel pickup was located in the right front portion of the left fuel tank.

The FAA inspector further stated that during the accident flight, the conductor was not completely off the ground and was being dragged over terrain. To compensate for the dragging resistance, the pilot had the helicopter in an aft or left attitude, with a higher nose-up attitude than normal flight. The operator's risk assessment form required that the helicopter be topped off (64 gallons) with fuel prior to and only fly for 1 hour during side pull operations, which would leave about 37 gallons of fuel remaining. For all other operations, including long line operations, the fuel requirement was to land with at least 100 lbs. (about 14.7 gallons) of fuel remaining. At the time of the accident, the helicopter had about 14 gallons of fuel remaining. After the accident, the operator amended its risk assessment form to include the same fuel requirement in long line operations as side pull operations.

Pilot Information

Certificate:	Commercial	**Age:**	31,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	June 2, 2017
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	April 30, 2016
Flight Time:	4325 hours (Total, all aircraft), 2556 hours (Total, this make and model), 4282 hours (Pilot In Command, all aircraft), 126 hours (Last 90 days, all aircraft), 43 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Hughes	**Registration:**	N765KV
Model/Series:	369 E	**Aircraft Category:**	Helicopter
Year of Manufacture:	1980	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	0082E
Landing Gear Type:	Skid	**Seats:**	4
Date/Type of Last Inspection:	June 6, 2017 100 hour	**Certified Max Gross Wt.:**	3000 lbs
Time Since Last Inspection:	16 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	28285 Hrs at time of accident	**Engine Manufacturer:**	Rolls-Royce
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	250 C20B
Registered Owner:	HAVERFIELD INTERNATIONAL INC	**Rated Power:**	420 Horsepower
Operator:	HAVERFIELD INTERNATIONAL INC	**Operating Certificate(s) Held:**	Rotorcraft external load (133)
Operator Does Business As:	HAVERFIELD AVIATION INC	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LWB,2301 ft msl	**Distance from Accident Site:**	15 Nautical Miles
Observation Time:	13:15 Local	**Direction from Accident Site:**	120°
Lowest Cloud Condition:		**Visibility**	7 miles
Lowest Ceiling:	Broken / 3200 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots / None	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	240°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.96 inches Hg	**Temperature/Dew Point:**	22°C / 19°C
Precipitation and Obscuration:	Light - None - Rain		
Departure Point:	Dennis, WV	**Type of Flight Plan Filed:**	None
Destination:	Dennis, WV	**Type of Clearance:**	None
Departure Time:	12:15 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	38.038887,-80.730834(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Charles Monola; FAA/FSDO; Charleston, WV Joan Gregoire; MD Helicopters; Phoenix, AZ Jon Michael; Rolls-Royce; Indianapolis, IN John Hobby; Boeing; Seattle, WA Stan Braun; Haverfield Helicopters; Gettysburg, PA
Original Publish Date:	April 4, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=95423

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.