Aviation Investigation Final Report

Location:	Lyman, Washington	**Accident Number:**	SEA07LA041
Date & Time:	January 4, 2007, 13:10 Local	**Registration:**	N1088G
Aircraft:	Hughes 369D	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious
Flight Conducted Under:	Part 133: Rotorcraft ext. load		

Analysis

The pilot made two long-line movements of cargo in light dry snow. After completing the second load, the pilot noticed that the snow had turned wet and heavy, and he told the ground crew that he was leaving the area. As he turned to depart the area, one of the ground crew radioed him and said that he was going to pass near one of the loads, and suggested that he pick it up. The pilot maneuvered toward the load, and entered into a hover to swing the long-line hook forward. Just as he entered the hover, the engine lost power, and the pilot delayed his emergency autorotation to allow the ground crew person to find cover. Because the rotor system energy decayed during the pilot's intentional delay of the autorotation, he was unable to control the descent, and the helicopter settled onto the terrain at an excessive rate of descent. The pilot stated that when he changed the angle of attack to put the hook in the right location, he believes a layer of wet snow and ice crystals lifted off the canopy and entered the engine particle separator, leading to a loss of engine power. A postaccident inspection did not reveal evidence of any system malfunction or anomaly.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's intentional flight into adverse weather conditions, which resulted in a loss of engine power during hover due to snow and ice ingestion. Factors associated with the accident are the pilot's delayed remedial actions, and snow and icing conditions.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: HOVER - OUT OF GROUND EFFECT

Findings
1. (C) TURBOSHAFT ENGINE - ICE INGESTION
2. (C) FLIGHT INTO KNOWN ADVERSE WEATHER - INTENTIONAL - PILOT IN COMMAND
3. (F) WEATHER CONDITION - SNOW
4. (F) WEATHER CONDITION - ICING CONDITIONS

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
5. (F) REMEDIAL ACTION - DELAYED - PILOT IN COMMAND
6. TERRAIN CONDITION - ROUGH/UNEVEN

Factual Information

On January 4, 2007, approximately 1310 Pacific standard time, a Hughes 369D helicopter, N1088G, impacted the terrain after a loss of engine power about six miles south of Lyman, Washington. The commercial pilot, who was the sole occupant, received serious injuries, and the aircraft, which is owned and operated by Highline Helicopters, sustained substantial damage. The local 14 CFR Part 133, long-line flight was being operated in visual meteorological conditions in an area where there was falling snow and ice crystals.

According to the pilot, he made two long-line movements of cargo in light dry snow. After completing the second load, the pilot noticed that the snow had turned wet and heavy. He therefore told the ground crew that he was going to get out of the area. But, as he turned to depart the area, one of the people on the ground radioed him and said that he was going to pass near one of the loads as he left the area. The individual suggested that the pilot pick up this one last load since he would pass so close to it. The pilot therefore maneuvered down toward the load, and then entered into a hover in order to swing the long-line hook forward. Just as he entered the hover, the engine lost power, and because the pilot delayed his autorotational descent in order to allow the ground crew person to find cover, most of the energy in the rotor system was used up by the time he lowered the collective. Because the rotor system energy was used up during the pilot's intentional delay of remedial action, he was unable to control the descent, so the helicopter settled onto the terrain at an excessive rate of descent.

It was the opinion of the pilot that when he changed the angle of attack to put the hook in the right location, a layer of wet snow and ice crystals lifted off the canopy and entered the particle separator, leading to a flameout that did not relight.

An FAA-directed inspection of the helicopter by representatives of McDonald-Douglas Helicopters and Allison (Rolls-Royce) Turbine Engines did not reveal evidence of any system malfunction or anomaly.

Pilot Information

Certificate:	Commercial	**Age:**	70,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	May 1, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	April 1, 2006
Flight Time:	22172 hours (Total, all aircraft), 20484 hours (Total, this make and model), 200 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Hughes	**Registration:**	N1088G
Model/Series:	369D	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	700736D
Landing Gear Type:	Skid	**Seats:**	5
Date/Type of Last Inspection:	December 1, 2006 100 hour	**Certified Max Gross Wt.:**	3550 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	5504 Hrs at time of accident	**Engine Manufacturer:**	Allison
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	250/C20B
Registered Owner:		**Rated Power:**	420 Horsepower
Operator:		**Operating Certificate(s) Held:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	500 ft AGL	**Visibility**	0.5 miles
Lowest Ceiling:	1000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	1°C
Precipitation and Obscuration:	Heavy - None - Snow		
Departure Point:	Lyman, WA	**Type of Flight Plan Filed:**	None
Destination:	Lyman, WA	**Type of Clearance:**	None
Departure Time:	13:05 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	48.447223,-122.053611

Administrative Information

Investigator In Charge (IIC):	Anderson, Orrin
Additional Participating Persons:	Joe DiMarco; Seattle FSDO
Original Publish Date:	April 25, 2007
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=65117