



National Transportation Safety Board Aviation Accident Final Report

Location:	Eugene, Oregon	Accident Number:	WPR19LA205
Date & Time:	July 27, 2019, 22:15 Local	Registration:	N438RC
Aircraft:	Md Helicopter 369	Aircraft Damage:	Substantial
Defining Event:	Loss of tail rotor effectiveness	Injuries:	2 Serious
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

The pilots reported that they were approaching the airport ramp area for landing from the east with a wind of 10 knots from the north. About 25 to 30 feet above the ramp at an airspeed of about 25 knots, the left seat pilot reduced left pedal pressure to turn the helicopter toward the right into the wind, then subsequently increased left pedal pressure to stop the turn; however, the helicopter continued right and began to spin. The pilot lowered the collective, and the right seat pilot took the flight controls in an attempt to slow the spin. The helicopter impacted the ground hard, spreading the landing skids and resulting in the tail rotor contacting the ramp.

Postaccident examination of the airframe and engine did not reveal any anomalies that would have precluded normal operation. The helicopter's altitude above the ramp, its low forward speed, and the right turn were conducive to the onset of a loss of tail rotor effectiveness (LTE). Given the lack of mechanical anomalies, it is likely that the loss of control was due to LTE.

Probable Cause and Findings

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

The left seat pilot's failure to account for environmental conditions conducive to a loss of tail rotor effectiveness, which resulted in a loss of tail rotor effectiveness and subsequent loss of control.

Findings

Personnel issues

Aircraft control - Pilot

Aircraft

Prop/rotor parameters - Not attained/maintained

Factual Information

On July 27, 2019, about 2215 Pacific daylight time, a McDonnell Douglas 369E helicopter, N438RC, was substantially damaged when it was involved in an accident near Eugene, Oregon. The two commercial pilots were seriously injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 positioning flight.

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Postaccident examination of the airframe and engine did not reveal any anomalies that would have precluded normal operation. The helicopter was mostly intact. Control continuity was established throughout the helicopter with no anomalies noted. Examination of the powertrain revealed a fracture of the main driveshaft flexible joint, and a fracture of the tail rotor driveshaft. All fracture features displayed signatures consistent with overstress.

Federal Aviation Administration Advisory Circular (AC) 90-95, *Unanticipated Right Yaw in Helicopters*, states, "Loss of tail rotor effectiveness (LTE) is a critical, low-speed aerodynamic flight characteristic which can result in an uncommanded rapid yaw rate which does not subside of its own accord and, if not corrected, can result in the loss of aircraft control."

In addition, the AC lists the conditions under which LTE may occur: "Any maneuver which requires the pilot to operate in a high-power, low airspeed environment with a left crosswind or tailwind..." and "There is greater susceptibility for LTE in right turns. This is especially true during flight at low airspeed since the pilot may not be able to stop the rotation."

History of Flight

Approach	Loss of tail rotor effectiveness (Defining event)
Approach	Collision with terr/obj (non-CFIT)
Landing	Hard landing

Pilot Information

Certificate:	Commercial	Age:	49, Male
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	April 10, 2019
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	April 26, 2019
Flight Time:	505 hours (Total, all aircraft), 14 hours (Total, this make and model), 398 hours (Pilot In Command, all aircraft), 14 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft)		

Co-pilot Information

Certificate:	Airline transport; Commercial; Flight instructor; Remote	Age:	74, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter; Instrument airplane; Instrument helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 Unknown	Last FAA Medical Exam:	March 15, 2017
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	999999 hours (Total, all aircraft), 9999 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Md Helicopter	Registration:	N438RC
Model/Series:	369 E	Aircraft Category:	Helicopter
Year of Manufacture:	1987	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	0245E
Landing Gear Type:	Skid	Seats:	5
Date/Type of Last Inspection:	February 12, 2019 Annual	Certified Max Gross Wt.:	2311 lbs
Time Since Last Inspection:	38 Hrs	Engines:	Turbo shaft
Airframe Total Time:	9497 Hrs as of last inspection	Engine Manufacturer:	Rolls Royce
ELT:	Installed	Engine Model/Series:	250-C20B
Registered Owner:		Rated Power:	420 Horsepower
Operator:		Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Night
Observation Facility, Elevation:	EUG,374 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	21:54 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	9 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	350°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.17 inches Hg	Temperature/Dew Point:	21 °C / 12 °C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Eugene, OR (EUG)	Type of Flight Plan Filed:	None
Destination:	Eugene, OR (EUG)	Type of Clearance:	VFR
Departure Time:		Type of Airspace:	

Airport Information

Airport:	Mahlon Sweet Field Airport EUG	Runway Surface Type:	Asphalt
Airport Elevation:	374 ft msl	Runway Surface Condition:	Dry
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	Unknown

Wreckage and Impact Information

Crew Injuries:	2 Serious	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Serious	Latitude, Longitude:	44.121387, -123.207221(est)

Administrative Information

Investigator In Charge (IIC):	Link, Samantha		
Additional Participating Persons:	Dee Rice; Federal Aviation Administration; Hillsboro, OR		
Original Publish Date:	April 21, 2022	Investigation Class:	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=99965		

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