



National Transportation Safety Board Aviation Accident Final Report

Location:	Blaine, WA	Accident Number:	WPR09TA001
Date & Time:	10/01/2008, 1840 PDT	Registration:	N172AE
Aircraft:	EUROCOPTER AS350B3	Aircraft Damage:	Substantial
Defining Event:	Hard landing	Injuries:	2 None
Flight Conducted Under:	Public Aircraft		

Analysis

During an annual helicopter proficiency evaluation flight, the flight instructor told the commercial pilot to conduct manual governor operations and the flight instructor then positioned the governor switch from "auto" to "man" while on the downwind leg to the runway. After performing a left 360-degree turn, the commercial pilot initiated a normal approach to the runway with the intention of performing a run-on landing. The commercial pilot stated that as the helicopter descended through 20 feet above ground level (agl), he attempted to increase throttle and collective to arrest the rate of descent when it "felt like the bottom fell out" and the helicopter landed hard on the asphalt runway surface in a slight nose high attitude. The flight instructor reported that he heard the aural low rotor RPM horn sound and noticed the rotor RPM was slowing through 350 rpm as the helicopter was descending through about 20 feet agl. The instructor stated that before he could react to correct the situation the helicopter struck the ground. Examination of the helicopter by a Federal Aviation Administration inspector revealed that the tail boom was partially bent and one of the main rotor blades was damaged. No preimpact mechanical anomalies with the helicopter were reported by either pilot.

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 main rotor rpm, which resulted in a hard landing. Contributing to the accident were the flight instructor's delayed remedial action and inadequate supervision of the flight.

Findings

Aircraft	Prop/rotor parameters - Not attained/maintained (Cause)
Personnel issues	Delayed action - Instructor/check pilot (Factor) Monitoring other person - Instructor/check pilot (Factor) Aircraft control - Pilot (Cause)

Factual Information

On October 1, 2008, about 1840 Pacific daylight time, a Eurocopter AS350 B3 helicopter, N172AE, was substantially damaged during a hard landing at the Blaine Municipal Airport, Blaine, Washington. The helicopter was registered to the US Department of Homeland Security and operated by the Customs and Border Protection (CBP) as a Public Use flight. The commercial pilot and flight instructor were not injured. Visual meteorological conditions prevailed and no flight plan was filed for the local training flight. The flight originated from Bellingham, Washington at 1815.

In written statements provided by the CBP, the pilot and flight instructor reported that they were conducting a series of practice emergency procedures during an annual proficiency evaluation flight. After the completion of two landings, the instructor announced that they were going to conduct manual governor operations and positioned the governor switch from "auto" to "man" while on the downwind leg to runway 32. After performing a left 360-degree turn, the pilot initiated an approach to the runway with the intention of performing a slide-on landing. While on final approach to the runway, the pilot stated he felt like he was slightly high and increased the rate of descent "to intercept a flatter approach profile."

At an altitude of about 80 feet above ground level (agl), the pilot increased throttle and slightly raised the collective to maintain a "flatter approach profile." Shortly after, he noticed the rotor rpm (NR) starting to slowly decay below the green arc and applied throttle. While NR continued to decay, the low rotor RPM warning horn sounded as NR approached 360 rpm. The pilot continued to increase throttle as NR stabilized at 350 rpm at an altitude of about 40 feet agl. The pilot stated that as the helicopter descended through 20 feet agl, he attempted to increase throttle and collective to arrest the rate of descent when it "felt like the bottom fell out" and the helicopter landed hard on the asphalt runway surface in a slight nose high attitude.

The flight instructor reported that he heard the aural low rotor RPM horn sound and noticed the rotor RPM was slowing through 350 rpm as the helicopter was descending through about 20 feet agl. The instructor stated that he positioned his left hand over the left collective twist grip, however, "before I could react to correct the situation," the helicopter struck the ground. The instructor added that he "believes he saw throttle twisting in the decreasing RPM direction" prior to him placing his hand on the twist grip.

Examination of the helicopter by a Federal Aviation Administration (FAA) inspector, who responded to the accident site, revealed that the tail boom was partially bent and one of the main rotor blades was damaged. No mechanical anomalies with the helicopter were reported by the commercial pilot or flight instructor.

History of Flight

Landing-flare/touchdown	Hard landing (Defining event)
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Flight Instructor Information

Certificate:	Airline Transport; Commercial	Age:	51, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	03/06/2008
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	03/06/2008
Flight Time:	8000 hours (Total, all aircraft), 1009 hours (Total, this make and model), 6050 hours (Pilot In Command, all aircraft), 57 hours (Last 90 days, all aircraft), 17 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Commercial	Age:	48, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last Medical Exam:	03/21/2008
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	09/12/2008
Flight Time:	6300 hours (Total, all aircraft), 1100 hours (Total, this make and model), 3500 hours (Pilot In Command, all aircraft), 85 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	EUROCOPTER	Registration:	N172AE
Model/Series:	AS350B3	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	3839
Landing Gear Type:	Skid	Seats:	5
Date/Type of Last Inspection:	08/28/2008, AAIP	Certified Max Gross Wt.:	4961 lbs
Time Since Last Inspection:	98.4 Hours	Engines:	1 Turbo Shaft
Airframe Total Time:	1590.5 Hours	Engine Manufacturer:	Turbomeca
ELT:	Installed, not activated	Engine Model/Series:	Arriel 2B
Registered Owner:	U S Department of Homeland Security	Rated Power:	847 hp
Operator:	United States Customs and Border Protection	Air Carrier Operating Certificate:	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	BLI, 170 ft msl	Observation Time:	1853 PDT
Distance from Accident Site:	14 Nautical Miles	Condition of Light:	Night/Dark
Direction from Accident Site:	147°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	14° C / 12° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	3 knots, Variable	Visibility (RVR):	
Altimeter Setting:	29.86 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Bellingham, WA (BLI)	Type of Flight Plan Filed:	Unknown
Destination:		Type of Clearance:	None
Departure Time:	1815 PDT	Type of Airspace:	Unknown

Airport Information

Airport:	Blaine Municipal Airport (4W6)	Runway Surface Type:	Asphalt
Airport Elevation:	75 ft	Runway Surface Condition:	Dry
Runway Used:	32	IFR Approach:	None
Runway Length/Width:	2539 ft / 40 ft	VFR Approach/Landing:	Simulated Forced Landing; Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None		

Administrative Information

Investigator In Charge (IIC):	Joshua Cawthra	Adopted Date:	03/23/2009
Additional Participating Persons:	Scott Peterson; Federal Aviation Administration; Seattle, WA Todd J Carlson; United States Customs and Border Protection; Washington, DC		
Publish Date:	03/23/2009		
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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