

Aviation Investigation Factual Report

Location:	Tehachapi, California	Accident Number:	WPR11GA431
Date & Time:	September 4, 2011, 15:00 Local	Registration:	N205WW
Aircraft:	Bell 205	Aircraft Damage:	Substantial
Defining Event:	Powerplant sys/comp malf/fail	Injuries:	1 Minor
Flight Conducted Under:	Part 133: Rotorcraft ext. load		

Factual Information

On September 4, 2011, about 1500 Pacific daylight time, a Bell 205 A1, N205WW, landed hard during an off field emergency autorotation near Tehachapi, California. The Kern County Fire Department was operating the helicopter as a public-use fire suppression flight under the provisions of 14 Code of Federal Regulations (CFR) Part 133. The commercial rated pilot sustained minor injuries; the helicopter sustained substantial damage to the tail boom from impact forces. A company visual flight rules (VFR) flight plan had been filed for the local flight.

The helicopter had a water bucket as an external load, and the pilot was preparing to drop a load on the leading edge of the fire. The helicopter was about 100 feet above ground level (agl) at 10 knots, when the engine revolutions per minute (rpm) light illuminated, and the low rotor rpm horn sounded. The pilot released the water, and made a left pedal turn to exit the canyon and move away from the fire. He checked his engine rotor rpm gauge and saw that the needles had split. The rotor rpm needle was at the 4-5 o'clock position, and the engine rpm needle was at the 6-o'clock position, which he stated indicated maximum rpm.

The helicopter was now about 400 feet agl, and the pilot spotted a landing zone for a landing. He perceived that the helicopter had a high side fuel control failure. He rolled off the throttle, and lowered the collective. After he placed the governor switch into manual mode, he rolled the throttle on while raising the collective. He felt the rotor rpm decrease as he pulled the collective, and saw that the gauge was at 90 percent. He was 250-300 feet agl, and felt that he was running out of altitude and rpm, so he lowered the collective to regain rpm, and established an autorotation into the landing zone.

After landing hard, which collapsed the landing skids, the pilot closed the throttle, turned off the fuel switches, and checked for fire/warning lights. He exited the helicopter to stop approaching civilians. Once he felt the area was secure, he checked for fire and assessed the damage. The helicopter sustained substantial damage to the airframe and tail boom. He reentered the cockpit, and reset the switches to post flight mode out of habit, and assessed the interior damage.

The helicopter was recovered to the operator's facility in Renton, Washington. An investigator from the engine manufacturer examined the engine under the supervision of the FAA. He confirmed both N1 and N2 control continuity from the pilot's seat to the engine, and observed that both controls traveled from stop to stop. The only anomaly discovered was a sheared N2 tachometer drive shaft.

A specialist from the National Transportation Safety Board's Materials Laboratory examined the N2 shaft. He determined that the shaft failed as a result of torsional overstress.

The N2 tachometer drive delivers engine rpm readings to the cockpit engine tachometer; failure of the N2 tachometer drive would send erroneous engine rpm readings to the cockpit. The pilot's instruments indicated that there was an engine overspeed, but the warning lights and audio were indicating a low power condition. The emergency procedures section of the flight manual states that in the event of an engine failure or low rotor rpm, a red light will illuminate and an audio signal will sound when the audio

switch is in the AUDIO position. The flight manual instructs the pilot to immediately execute an autorotative descent.

Pilot Information

Certificate:	Commercial; Private	Age:	54
Airplane Rating(s):	Single-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	Helicopter	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	December 3, 2010
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	9304 hours (Total, all aircraft), 865 hours (Total, this make and model), 9103 hours (Pilot In Command, all aircraft), 138 hours (Last 90 days, all aircraft), 37 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	Registration:	N205WW
Model/Series:	205 A1	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	30329
Landing Gear Type:	High skid	Seats:	11
Date/Type of Last Inspection:	August 31, 2011 100 hour	Certified Max Gross Wt.:	10500 lbs
Time Since Last Inspection:	89 Hrs	Engines:	1 Turbo shaft
Airframe Total Time:	3560 Hrs at time of accident	Engine Manufacturer:	Honeywell
ELT:	Installed, not activated	Engine Model/Series:	T5317B
Registered Owner:	Blades LLC	Rated Power:	
Operator:	Kern County	Operating Certificate(s) Held:	Rotorcraft external load (133)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KTSP,4001 ft msl	Distance from Accident Site:	
Observation Time:	14:55 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	13 knots / 19 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	310°	Turbulence Severity Forecast/Actual:	/ Unknown
Altimeter Setting:	30.03 inches Hg	Temperature/Dew Point:	30°C / -2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Tehachapi, CA	Type of Flight Plan Filed:	Company VFR
Destination:	Tehachapi, CA	Type of Clearance:	None
Departure Time:	13:55 Local	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	35.064445,-118.423614

Administrative Information

Investigator In Charge (IIC):	Plagens, Howard
Additional Participating Persons:	Frank Motter; Federal Aviation Administration FSDO; Van Nuys, CA
Report Date:	September 23, 2014
Last Revision Date:	
Investigation Class:	<u>Class</u>
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=81707

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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 <u>here</u>.