



National Transportation Safety Board Aviation Accident Final Report

Location:	VENICE, LA	Accident Number:	FTW99LA155
Date & Time:	06/01/1999, 1448 CDT	Registration:	N7131U
Aircraft:	Bell 206B	Aircraft Damage:	Substantial
Defining Event:		Injuries:	3 None

Flight Conducted Under: Part 91: General Aviation - Aerial Observation

Analysis

About 150 feet agl and 60 knots, as the helicopter was accelerating, the pilot heard a loud 'bang,' and the low rotor rpm and engine out audio warning activated. The pilot initiated an autorotation to a grassy area, 'flared the aircraft, and placed it in six to eight inches of water.' A main rotor blade contacted the tailboom, partially separating it aft of the horizontal stabilizer. A passenger reported that the pilot 'pulled pitch right before the landing and we landed with one medium bump and then followed very quickly with another medium bump with a loud sound with it.' The passenger further reported that the landing attitude was 'relatively normal;' however, 'it was possibly a little more pitched up than normal.' An examination of the engine revealed that the Spur Adapter Gearshaft was fractured at the forward splines. According to the engine manufacturer's metallurgist, 'severe spline wear led to [the] spiral fatigue failure of the Spur Adapter Gearshaft and Compressor Adapter Coupling.' The reason for the spline wear was not determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's improper touchdown procedure, resulting in a main rotor blade contacting the tailboom. Factors were the soft and wet terrain conditions, and the loss of engine power due to the spiral fatigue failure of the gas generator turbine shafting due to spline wear.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: CRUISE

Findings

1. (F) TURBOSHAFT ENGINE,GAS GENERATOR TURBINE SHAFT - WORN
2. (F) TURBOSHAFT ENGINE,GAS GENERATOR TURBINE SHAFT - FATIGUE
3. (F) TURBOSHAFT ENGINE,GAS GENERATOR TURBINE SHAFT - FRACTURED
4. TURBOSHAFT ENGINE,GAS GENERATOR TURBINE SHAFT - SEPARATION
5. AUTOROTATION - INITIATED - PILOT IN COMMAND

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

Occurrence #3: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

6. (F) TERRAIN CONDITION - WET
7. (F) TERRAIN CONDITION - SOFT
8. (C) TOUCHDOWN - IMPROPER - PILOT IN COMMAND
9. MISC ROTORCRAFT,MAIN ROTOR/TAIL BOOM CONTACT

Factual Information

On June 1, 1999, at 1448 central daylight time, a Bell 206B helicopter, N7131U, was substantially damaged during a forced landing, following a loss of engine power near Venice, Louisiana. The helicopter was owned and operated by Chevron USA, Inc., of New Orleans, Louisiana. The commercial pilot and the two passengers were not injured. Visual meteorological conditions prevailed, and a company VFR flight plan was filed for the 14 Code of Federal Regulations Part 91 aerial observation flight. The local flight originated from the West Delta 30 platform located in the Gulf of Mexico, at 1426.

The pilot reported that he flew the helicopter at an altitude of about 150 feet agl and an airspeed of 60 knots, while inspecting a pipeline, which was reported to have a possible oil leak. After completing the inspection, as the helicopter was accelerating (to return to West Delta 30), he heard a loud "bang," and the low rotor rpm and engine out audio warnings activated. The pilot further reported that he "entered autorotation, flared the aircraft, and placed it in six to eight inches of water. It was a grassy area, so I didn't pop the floats."

The passengers reported hearing a loud "bang," and the aircraft began to "shudder/shake." The passenger in the rear seat reported that after the bang, he heard a "metallic grinding screeching sound." The helicopter "lurched," yawed to the left, and "pitched forward." The pilot maneuvered the helicopter to the "edge of open water and onto a grassy mat in the marsh." The pilot "pulled pitch right before the landing and we landed with one medium bump and then followed very quickly with another medium bump with a loud sound with it." The rear seat passenger further reported that the landing attitude was "relatively normal;" however, "it was possibly a little more pitched up than normal." The rear seat passenger also reported that the landing was "reasonably soft."

Examination of the helicopter by the FAA inspector revealed that the tailboom was partially separated aft of the horizontal stabilizer, and the tail rotor assembly was damaged. Both main rotor blades were damaged. A piece of blade, aft of the main spar and outboard of the trim tab, was separated from one main rotor blade. The outboard section of this blade was bent upward.

A teardown examination of the Allison 250-C20J engine, serial number CAE270491, was conducted at the operator's maintenance facility in New Orleans, Louisiana, under the supervision of the FAA. A continuity check of the compressor through the accessory gearbox revealed a disconnect. Removal of the compressor section revealed that the Spur Adapter Gearshaft (SAG) was fractured at the forward splines. The accessory gearbox was torn down revealing "major" damage to the #2-1/2 roller bearing. The lower magnetic plug had a "large" amount of flaking type debris adhering to it, and the upper gearbox magnetic plug had a "small" amount of sliver type debris adhering to it. According to the engine manufacturer's metallurgist, "severe spline wear led to [the] spiral fatigue failure of the Spur Adapter Gearshaft and Compressor Adapter Coupling." The damage to the #2-1/2 bearing "appeared to be secondary" to the failure of the SAG. The metallurgist reported that "no metallurgical cause was determined for the spline wear." The compressor had accumulated a total time of 11,898.2 hours, with 2,694.9 hours since overhaul. See the excerpts of the enclosed manufacturer report for details of the examination.

Pilot Information

Certificate:	Commercial; Private	Age:	38, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	Last FAA Medical Exam:	09/08/1998
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	3385 hours (Total, all aircraft), 1825 hours (Total, this make and model), 2036 hours (Pilot In Command, all aircraft), 162 hours (Last 90 days, all aircraft), 55 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	Registration:	N7131U
Model/Series:	206B 206B	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	4111
Landing Gear Type:	High Skid	Seats:	5
Date/Type of Last Inspection:	05/06/1999, AAIP	Certified Max Gross Wt.:	3200 lbs
Time Since Last Inspection:	44 Hours	Engines:	1 Turbo Shaft
Airframe Total Time:	6464 Hours	Engine Manufacturer:	Allison
ELT:	Installed, not activated	Engine Model/Series:	250C-20J
Registered Owner:	CHEVRON USA, INC.	Rated Power:	420 hp
Operator:	CHEVRON USA, INC.	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	AC2A

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	, 0 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	0000	Direction from Accident Site:	0°
Lowest Cloud Condition:	Unknown / 0 ft agl	Visibility	7 Miles
Lowest Ceiling:	Broken / 3000 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	130°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	31 °C
Precipitation and Obscuration:			
Departure Point:	WEST DELTA 30, GM (NONE)	Type of Flight Plan Filed:	Company VFR
Destination:		Type of Clearance:	VFR on top
Departure Time:	1426 CDT	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	2 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	DOUGLAS D WIGINGTON	Report Date:	11/30/2000
Additional Participating Persons:	JAMES R COPPIT; BATON ROUGE, LA		
Publish Date:			
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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