



National Transportation Safety Board Aviation Accident Final Report

Location:	ROCKPORT, TX	Accident Number:	FTW01LA036
Date & Time:	12/01/2000, 1619 CST	Registration:	N222LM
Aircraft:	Bell 206B	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 None

Flight Conducted Under: Part 91: General Aviation - Positioning

Analysis

The helicopter was returning to shore from an oil platform. The pilot had just made a "5 mile advisory call" announcing his intention to land at his destination when the engine chip light illuminated; this was followed by an immediate loss of engine power. The pilot initiated an autorotation, inflated the floats and made a mayday call. During the descent, he "had full [aircraft] control to include tail rotor authority." During landing, the tail rotor blades entered the water resulting in sudden stoppage of the tail rotor, which twisted the tail rotor drive shaft apart. Following the landing, the helicopter remained upright, and the pilot exited the helicopter after the main rotor blades came to a stop due to the "waves and wind." After he moved away from the helicopter, it rolled over. The pilot reported that the wind was from 045 degrees at 15 knots gusting to 25 knots. An examination of the turbine engine revealed that the N1 gas producer would not turn. Disassembly of the engine revealed that the compressor coupling adapter was fractured. Metallurgical examination indicated that the compressor coupling adapter had failed due to fatigue initiating from fretting at the outer surface where it contacted the impeller. The source of the fretting could not be determined.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the loss of engine power during cruise flight due to the fatigue fracture of the compressor coupling adapter. A contributing factor was the high sea condition existing for the forced landing.

Findings

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

Findings

1. (C) TURBOSHAFT ENGINE,GAS GENERATOR TURBINE SHAFT - FATIGUE
2. (C) TURBOSHAFT ENGINE,GAS GENERATOR TURBINE SHAFT - FAILURE

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

Findings

3. AUTOROTATION - PERFORMED - PILOT IN COMMAND

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

4. (F) TERRAIN CONDITION - LARGE WAVE/SWELL
5. ROTOR SYSTEM,TAIL ROTOR - BLADE STRIKE

Factual Information

On December 1, 2000, at 1619 central standard time, a Bell 206B helicopter, N222LM, was substantially damaged during a water landing following a loss of engine power near Rockport, Texas. The helicopter was owned and operated by American Helicopters, Inc., of Galveston, Texas. The commercial pilot, sole occupant, was not injured. Visual meteorological conditions prevailed, and a company VFR flight plan was filed for the 14 Code of Federal Regulations Part 91 positioning flight. The flight originated from the Matagorda 603 offshore platform located in the Gulf of Mexico, at 1555, and was destined for the Aransas County Airport, Rockport, Texas.

The pilot reported that he had just made a "5 mile advisory call" announcing his intention to land at the Aransas County Airport when the engine chip light illuminated; this was followed by an immediate loss of engine power. The pilot initiated an autorotation, inflated the floats and made a mayday call with direction, distance from the airport, and the cause of the mayday call. During the descent he had "full [aircraft] control to include tail rotor authority." The helicopter landed on the water and remained upright and afloat. The pilot further reported that he exited the helicopter after the blades came to a stop due to the "waves and wind." After moving away from the helicopter it rolled over. The pilot crawled onto the belly of the helicopter and waited to be rescued. The pilot stated that the wind was from 045 degrees at 15 knots gusting to 25 knots.

An examination of the helicopter by the FAA inspector revealed that the tail rotor drive shaft was severed. Examination of the tail rotor drive shaft by an NTSB investigator revealed that the torsional twisting of the drive shaft was consistent with sudden stoppage of the tail rotor while the main rotor was driving. There was also evidence of a main rotor blade strike to the tail rotor drive shaft cover. Examination of the Allison 250-C20 turbine engine revealed that the N1 gas producer would not turn.

A disassembly examination of the engine was conducted on January 17-18, 2001, at Dallas Airmotive of Dallas, Texas. During the examination the compressor coupling adapter was found fractured. The part was sent to the NTSB Materials Laboratory in Washington, D.C. for further examination.

The examination of the compressor coupling adapter, P/N E23039791, S/N AG6-107, at the NTSB Materials Laboratory revealed fretting on the outer diameter surface where the impeller was press fit onto the adapter. The fretting was only present on the aft portion of the contact surface. Longitudinal scratches were observed around the circumference of the outer diameter surface. One scratch that was examined using scanning electron microscopy (SEM), showed smearing consistent with the aft movement of the compressor coupling adapter relative to the impeller, a relative motion consistent with the disassembly of the components. The aft fracture surface of the compressor coupling adapter was mostly obliterated by post fracture damage. The forward fracture surface had less post fracture damage. The fracture surface was relatively smooth, and crack arrest marks were observed, features typical of fatigue. The fracture was perpendicular to the outer surface and formed a shallow spiral around the longitudinal axis. The spiral was consistent with fatigue propagation with a clockwise (as viewed from aft) loading applied at the aft end relative to the forward end. The fatigue region was present nearly 360 degrees around the circumference. The fatigue features emanated from an origin area at the outer diameter surface in an area of fretting. Some deformation was observed on

the faces of the hexagonal hole at the forward end of the compressor coupling adapter. No fretting was observed in that location.

Pilot Information

Certificate:	Commercial	Age:	34, Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	Seatbelt
Instrument Rating(s):	Helicopter	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	03/22/2000
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	2354 hours (Total, all aircraft), 707 hours (Total, this make and model), 1625 hours (Pilot In Command, all aircraft), 134 hours (Last 90 days, all aircraft), 39 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	Registration:	N222LM
Model/Series:	206B 206B	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Restricted	Serial Number:	1916
Landing Gear Type:	Skid	Seats:	5
Date/Type of Last Inspection:	100 Hour	Certified Max Gross Wt.:	3200 lbs
Time Since Last Inspection:	49 Hours	Engines:	1 Turbo Shaft
Airframe Total Time:	20893 Hours	Engine Manufacturer:	Allison
ELT:		Engine Model/Series:	250-C20B
Registered Owner:	AMERICAN HELICOPTERS, INC.	Rated Power:	420 hp
Operator:	AMERICAN HELICOPTERS, INC.	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	UP8A

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:	Scattered / 3500 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	15 knots / 25 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	45°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	65° C / 60° C
Precipitation and Obscuration:			
Departure Point:	MATAGORDA 603, GM	Type of Flight Plan Filed:	Company VFR
Destination:	(RKP)	Type of Clearance:	VFR on top
Departure Time:	1555 CST	Type of Airspace:	Class G

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	DOUGLAS D WIGINGTON	Report Date:	10/09/2001
Additional Participating Persons:	ROBERT A DAILY; HOUSTON, TX JOHN J SWIFT; INDIANAPOLIS, IN LARRY SHIEMBOB; MESA, AZ		
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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