National Transportation Safety Board
Aviation Accident Data Summary

Location:	High Island 573, GM	**Accident Number:**	FTW04FA029
Date & Time:	12/01/2003, 0821 CST	**Registration:**	N457PH
Aircraft:	Bell 407	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The helicopter, which had a FADEC controlled turboshaft engine installed, was in cruise flight over open ocean water in the Gulf of Mexico when the 14,000-hour helicopter pilot radioed a brief MAYDAY distress call on an area operating frequency. Details of the in-flight emergency were not relayed by the pilot, and no further communications were heard. Three hours later, the pilot's body was found floating in the area the helicopter was operating. After 3 days of search, the submerged helicopter wreckage was recovered from approximately 240 feet of water. Deformations of the airframe, along with the lack of damage to the main rotor blades, showed evidence that the helicopter impacted the water at a high vertical rate with low rotor RPM. Teardown examination of the engine revealed a catastrophic failure of the power turbine assembly (N2). Metallurgical examinations by the NTSB and Rolls Royce revealed evidence that the 3rd stage turbine wheel airfoil(s) had failed. A root cause of the failure was not determined, and further testing was conducted at Rolls Royce. As a result of some of the dynamic test results, Rolls Royce issued several Commercial Engine Bulletins (CEBs) regarding inspection of in-service turbine assemblies. Additionally, Bell Helicopter issued an Alert Service Bulletin (ASB), which introduced flight manual revisions to avoid power turbine RPM (Np) steady state operation between 68% and 97%. After examinations of the airframe (fuel system, rotor systems, flight control systems, drive systems, electronic control systems), no anomalies were found other than within the power turbine assembly.

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be:
The loss of engine power due to the failure of the 3rd stage turbine wheel and subsequent catastrophic failure of the turbine assembly.

Findings

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

Findings
1. (C) TURBINE ASSEMBLY,TURBINE WHEEL - FAILURE
2. (C) TURBINE ASSEMBLY - FAILURE,TOTAL

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

Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
3. TERRAIN CONDITION - WATER

Pilot Information

Certificate:	Commercial	**Age:**	61
Airplane Rating(s):	None	**Instrument Rating(s):**	Helicopter
Other Aircraft Rating(s):	Helicopter	**Instructor Rating(s):**	None
Flight Time:	14191 hours (Total, all aircraft), 844 hours (Total, this make and model), 11631 hours (Pilot In Command, all aircraft), 151 hours (Last 90 days, all aircraft), 52 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Bell	**Registration:**	N457PH
Model/Series:	407	**Engines:**	1 Turbo Shaft
Operator:	PETROLEUM HELICOPTERS INC	**Engine Manufacturer:**	Allison
Operating Certificate(s) Held:	On-demand Air Taxi (135)	**Engine Model/Series:**	250-C47B
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:		**Weather Information Source:**	Witness
Lowest Ceiling:	None	**Wind Speed/Gusts, Direction:**	14 knots / , 60°
Temperature:	21°C	**Visibility**	15 Miles
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	High Island 573, GM (NONE)	**Destination:**	High Island 264, GM (NONE)

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Latitude, Longitude:	28.000278, -93.918889		

Administrative Information

Investigator In Charge (IIC):	Alexander Lemishko	**Adopted Date:**	09/13/2005
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.ntsb.gov/pubdms/.		