



Aviation Investigation Factual Report

Location:	Key Biscayne, Florida	Accident Number:	ERA24LA166
Date & Time:	April 6, 2024, 13:50 Local	Registration:	N234ZT
Aircraft:	ROBINSON HELICOPTER R44	Aircraft Damage:	Substantial
Defining Event:	Unknown or undetermined	Injuries:	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Factual Information

On April 6, 2024, about 1350 eastern daylight time, a Robinson R-44, N234ZT, was substantially damaged when it was involved in an accident near Key Biscayne, Florida. The pilot was seriously injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the pilot, he topped off the fuel tanks at Miami Executive Airport (TMB), Miami, Florida, completed a preflight inspection, and was flying on a visual-flight-rules (VFR) flight plan with VFR flight following services to North Eleuthera Airport (MYEH), North Eleuthera, Bahamas. About 20 minutes after departure, after leveling off, he felt a millisecond “jerk.” He felt something similar the week before and had attributed it to a thermal or gust. Although there were no caution/warning illuminations or aural warnings, and the engine gauges were all “in the green,” he turned back toward land as a precaution. A minute later, he felt another “jerk.” He descended to 500 ft above ground level while applying carburetor heat. The pilot then felt a longer “shake,” at which time he declared an emergency. He began hearing odd engine sounds and noted that he was having to add power as the helicopter was decelerating. While maneuvering the helicopter as close to land as possible, the pilot started to feel a vibration, the low main rotor rpm horn sounded, and the pilot described that the engine had lost a “significant” amount of power. The pilot began an autorotation, and the helicopter entered the Atlantic Ocean at about 35 kts and about 1 nm from Key Biscayne. The helicopter’s empennage was substantially damaged, and the aft portion of the tail section was impact separated.

The wreckage was recovered and examined. The tail rotor system and gearbox were not recovered from the ocean. Postaccident examination of the airframe revealed that the gascolator bowl contained a mixture liquid consistent in color and odor with aviation fuel, some clear liquid that appeared to be water, and a small amount of rust-colored liquid. About 22 gallons of fuel and 20 gallons of water were removed from the fuel tanks. A minimum fuel flow test was performed for the main tank per the maintenance manual, and the results were within the acceptable allowance. The carburetor heat was extended about 2.3 inches, and the down-latch was not engaged. The carburetor heat valve air filter housing was partially open.

Postaccident examination of the engine revealed evidence of saltwater and saltwater corrosion. The engine’s crankshaft could not be rotated when attempting to rotate the cooling fan by hand. The crankcase contained about 2 gallons of salt water, and the oil quick drain was obstructed with sludge that had to be removed to drain the oil. The remaining oil was sufficient for engine operation. All six cylinders were removed and examined. The No. 5 cylinder was difficult to remove from the piston, and once freed, a large quantity of blackened salt-like

deposits was noted between the No. 5 cylinder and the cylinder wall. All cylinders had varying amounts of salt deposits and were heavily corroded consistent with submersion in salt water. With the cylinders removed, crankshaft and camshaft continuity was confirmed.

Once the cylinder valves were released from the binding of the corrosion and deposits, all exhaust and intake valves were examined and moved freely in their respective valve guide; no scoring, material transfer, or carbon deposits were noted on the shafts of the valves. Salt deposits and corrosion were noted throughout the carburetor consistent with submersion in salt water. The fuel inlet screen was examined and found to have saltwater contamination. Both magnetos were filled with salt deposits and corroded from saltwater immersion. The magnetos were rotated by hand and no spark was noted at any of the ignition towers. The engine governor control box was functionally tested on an engineering test stand and passed all testing parameters. Examination of the airframe and engine revealed no malfunctions that would have prevented normal operation of the helicopter or its engine. Significant saltwater sediment contaminated many hoses and accessories and prevented the determination of any pre-impact anomalies that may have affected normal operation.

The 1353 weather recorded at TMB, 15 miles west of the accident site, included a temperature of 80.6°F and a dew point of 55.4°F. These conditions corresponded to the development of carburetor icing at glide power on a Carburetor Icing Probability Chart.

A review of engine maintenance records showed that during the annual inspection completed on August 5, 2023, the right magneto and the crankshaft output seal were replaced, and the No. 4 cylinder failed the minimum exhaust valve clearance and was reamed per the service bulletin (388C) instructions.

Pilot Information

Certificate:	Private	Age:	55, Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	June 1, 2022
Occupational Pilot:	No	Last Flight Review or Equivalent:	June 30, 2023
Flight Time:	793 hours (Total, all aircraft), 725 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	ROBINSON HELICOPTER	Registration:	N234ZT
Model/Series:	R44	Aircraft Category:	Helicopter
Year of Manufacture:	2017	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	30027
Landing Gear Type:	None; Skid	Seats:	2
Date/Type of Last Inspection:	July 31, 2023 Annual	Certified Max Gross Wt.:	2200 lbs
Time Since Last Inspection:	456 Hrs	Engines:	1 Turbo shaft
Airframe Total Time:	550 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	C91 installed, not activated	Engine Model/Series:	O-540-F1B5
Registered Owner:	On file	Rated Power:	210 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	TMB,10 ft msl	Distance from Accident Site:	16 Nautical Miles
Observation Time:	13:53 Local	Direction from Accident Site:	267°
Lowest Cloud Condition:	Few / 4500 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	9 knots / 17 knots	Turbulence Type Forecast/Actual:	Unknown / None
Wind Direction:	290°	Turbulence Severity Forecast/Actual:	Unknown / N/A
Altimeter Setting:	30.02 inches Hg	Temperature/Dew Point:	27°C / 13°C
Precipitation and Obscuration:			
Departure Point:	Miami, FL (TMB)	Type of Flight Plan Filed:	VFR
Destination:	North Eleuthera, OF (MYEH)	Type of Clearance:	VFR,VFR flight following
Departure Time:	13:32 Local	Type of Airspace:	Class E

Wreckage and Impact Information

Crew Injuries:	1 Serious	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	1 Serious	Latitude, Longitude:	25.66406,-80.13981

Administrative Information

Investigator In Charge (IIC):	Spencer, Lynn
Additional Participating Persons:	Juan Garcia; FAA/FSDO; Miramar, FL Russel Gait; Lycoming Engines; Williamsport, PA Ken Martin; Robinson Helicopter; Torrance, CA
Report Date:	
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=194041

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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 [here](#).