



Aviation Investigation Final Report

Location:	Marble Falls, Texas	Accident Number:	WPR23LA263
Date & Time:	July 9, 2023, 09:47 Local	Registration:	N163RK
Aircraft:	ROBINSON HELICOPTER COMPANY R44 II	Aircraft Damage:	Substantial
Defining Event:	Fuel contamination	Injuries:	3 None
Flight Conducted Under:	Part 91: General aviation - Aerial observation		

Analysis

The pilot of the helicopter was conducting an aerial observation flight when, about 250 ft above ground level (agl) and about 50 knots indicated airspeed, the engine lost total power. The pilot entered an autorotation, negotiated a powerline, and landed on a hill. During the landing, the helicopter rocked forward and aft, striking and substantially damaging the lower vertical stabilizer.

Postaccident examination revealed water and a reddish-colored polyamide substance in the main fuel tank, auxiliary fuel tank, electric fuel pump, and gascolator. Further examination of the polyamide was inconclusive for a single known substance. The pilot reported that during the three-day mission, he refueled the helicopter at three different airports as well as his own personal fuel supply. Postaccident examination of the owner's personal fuel supply and each of the airport's fuel delivery systems did not reveal the presence of contamination. The circumstances of the accident are consistent with a total loss of engine power due to fuel contamination; however, the source of the contamination could not be determined based on the available information.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

A total loss of engine power due to fuel contamination from an unknown source.

Findings

Aircraft	Fuel - Fluid condition
Aircraft	Fuel pumps - Damaged/degraded

Factual Information

History of Flight

Enroute	Fuel contamination (Defining event)
Autorotation	Collision with terr/obj (non-CFIT)

On July 9, 2023, about 0947 central daylight time, a Robinson R-44 II helicopter, N163RK, was substantially damaged when it was involved in an accident near Marble Falls, Texas. The pilot and two passengers were not injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 aerial observation flight.

The pilot reported that he was conducting a power pole inspection flight along with two non-pilot crewmembers. During the third day of the mission and while about 250 ft above ground level (agl) and about 50 knots indicated airspeed, the engine lost total power. The pilot entered an autorotation and turned right to an area suitable for a forced landing. During the descent, he saw a set of power distribution lines that crossed his path. He increased the collective control to clear the power lines and after he passed over the power lines, he felt a slight shudder. The helicopter touched down on slightly sloped terrain. During the touchdown, the helicopter rocked forward and aft. The lower vertical stabilizer contacted the ground, resulting in substantial damage. The pilot and crew exited unassisted.

Examination of the helicopter revealed that both fuel tanks and the gascolator contained fuel along with a reddish-brown fluid that tested positive for water. According to a mechanic who performed postaccident maintenance on the helicopter, both fuel cells were coated on the inside with the red substance, and the electric fuel pump was clogged with the red substance. He stated that the red substance could only be dissolved with a methyl ethyl ketone (MEK) equivalent cleaner. The fuel samples were shipped to the NTSB Materials Laboratory for further examination.

Further testing of the contaminated fuel samples revealed that the sample was consistent with a polyamide; however, a spectral library search did not find any strong matches to a single known substance.

The pilot reported that he obtained fuel from several different airports as well as his own personal supply during the three-day mission; postaccident testing revealed no contamination in any of the fuel delivery systems.

Pilot Information

Certificate:	Commercial; Flight instructor	Age:	46, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	3-point
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	
Instructor Rating(s):	Helicopter; Instrument helicopter	Toxicology Performed:	
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	June 12, 2023
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	May 4, 2022
Flight Time:	5080 hours (Total, all aircraft), 1603 hours (Total, this make and model), 4852 hours (Pilot In Command, all aircraft), 94 hours (Last 90 days, all aircraft), 34 hours (Last 30 days, all aircraft), 15 hours (Last 24 hours, all aircraft)		

Other flight crew Information

Certificate:		Age:	Male
Airplane Rating(s):		Seat Occupied:	Right
Other Aircraft Rating(s):		Restraint Used:	3-point
Instrument Rating(s):		Second Pilot Present:	
Instructor Rating(s):		Toxicology Performed:	
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	UNK	Last Flight Review or Equivalent:	
Flight Time:			

Passenger Information

Certificate:		Age:	Female
Airplane Rating(s):		Seat Occupied:	Left
Other Aircraft Rating(s):		Restraint Used:	
Instrument Rating(s):		Second Pilot Present:	
Instructor Rating(s):		Toxicology Performed:	
Medical Certification:		Last FAA Medical Exam:	
Occupational Pilot:	UNK	Last Flight Review or Equivalent:	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	ROBINSON HELICOPTER COMPANY	Registration:	N163RK
Model/Series:	R44 II	Aircraft Category:	Helicopter
Year of Manufacture:	2006	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	11120
Landing Gear Type:	Skid	Seats:	4
Date/Type of Last Inspection:	June 16, 2023 Annual	Certified Max Gross Wt.:	2500 lbs
Time Since Last Inspection:	0 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	5590 Hrs as of last inspection	Engine Manufacturer:	Lycoming
ELT:	Installed, not activated	Engine Model/Series:	IO-540-AE1A5
Registered Owner:	Lone Star Aircraft Holdings LLC.	Rated Power:	245 Horsepower
Operator:	Lone Star Aircraft Holdings LLC.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KDZB,1093 ft msl	Distance from Accident Site:	6 Nautical Miles
Observation Time:	16:15 Local	Direction from Accident Site:	247°
Lowest Cloud Condition:	Scattered / 8000 ft AGL	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	170°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	29.87 inches Hg	Temperature/Dew Point:	38°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Lago Vista, TX (RYW)	Type of Flight Plan Filed:	None
Destination:	Lago Vista, TX (RYW)	Type of Clearance:	None
Departure Time:	09:41 Local	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:		Aircraft Explosion:	None
Total Injuries:	3 None	Latitude, Longitude:	30.570303,-98.26327(est)

Administrative Information

Investigator In Charge (IIC):	Salazar, Fabian
Additional Participating Persons:	Carl Newton; Federal Aviation Administration; San Antonio, TX
Original Publish Date:	November 21, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=192581

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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](#).