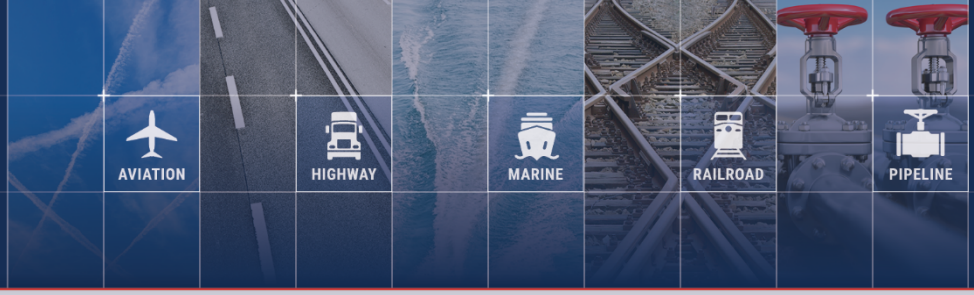

Aviation Investigation Final Report

Location:	Cass, Arkansas	**Accident Number:**	CEN19FA160
Date & Time:	June 2, 2019, 19:50 Local	**Registration:**	N41351
Aircraft:	Robinson R44	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	3 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

The pilot and three passengers departed on a local sightseeing flight at a music festival. The helicopter impacted a densely wooded area and came to rest between trees on its right side. The surviving passenger stated to the media that the helicopter's engine made sounds "like your car does when it runs out of fuel."

Examination of the helicopter at the accident site indicated evidence of main rotor blade rotation; however, damage to the engine drive system did not reveal evidence of engine power at the time of impact. Additionally, the oil pressure warning light bulb filament was found stretched consistent with illumination at the time of impact, which according to the helicopter's operating handbook, may be one indication of a loss of engine power. About 5 gallons of fuel was drained from the helicopter following the accident, with no evidence of fuel contamination. Examination of the airframe, flight controls, and engine revealed no evidence of any preimpact mechanical anomalies that would have precluded normal operation.

Probable Cause and Findings

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

A loss of engine power for reasons that could not be determined based on the available information.

Findings

Aircraft	(general) - Not attained/maintained

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of engine power (total) (Defining event)
Maneuvering-low-alt flying	Loss of control in flight

On June 2, 2019, about 1950 central daylight time, a Robinson R44 II helicopter, N41351, was substantially damaged when it was involved in an accident near Cass, Arkansas. The pilot and two passengers were fatally injured, and one passenger survived with serious injuries. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 sightseeing flight.

The helicopter flew passengers from a local music festival over the densely wooded area to the south of the performance arena. The helicopter was reported overdue and was located by search and rescue crews in a densely wooded area of the Ozark National Forest. There were no witnesses to the accident.

A witness recalled seeing the helicopter while camping at the music festival. He saw the helicopter flying in an area different from the previous flights. He saw the helicopter's nose pitch "dramatically" up. The helicopter climbed and then its climb stopped, sliding backwards tail first before the nose of the helicopter pitched rapidly down. The helicopter then entered a right turn and descended out of his view. He did not witness an impact and did not know about the accident until after viewing news reports. It is unknown if this was the accident sequence or if he witnessed a previous flight.

The survivor of the accident was unable to provide a statement to investigators. During media interviews he stated that "the helicopter started chugging like your car does when it runs out of fuel. The engine cut and we started dropping."

A review of Automatic Dependent Surveillance – Broadcast (ADS-B) information captured numerous sporadic points of multiple flights flown on the day of the accident. The last recorded points captured the helicopter in a left turn about 200-300 ft above ground level at a groundspeed between 55 and 70 knots. The final point was about 250 yards from the accident site.

Pilot Information

Certificate:	Commercial	**Age:**	51,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Unmanned (sUAS)	**Restraint Used:**	3-point
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Instrument helicopter	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	December 19, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	5000 hours (Total, all aircraft)		

The pilot's logbooks were not available for review. On his most recent application for a Federal Aviation Administration (FAA) medical certificate, dated December 19, 2018, the pilot reported 5,000 total hours of flight experience with 200 hours in the preceding 6 months.

Aircraft and Owner/Operator Information

Aircraft Make:	Robinson	**Registration:**	N41351
Model/Series:	R44 II	**Aircraft Category:**	Helicopter
Year of Manufacture:	2008	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	12351
Landing Gear Type:	N/A; High skid	**Seats:**	4
Date/Type of Last Inspection:	May 6, 2019 Annual	**Certified Max Gross Wt.:**	2500 lbs
Time Since Last Inspection:	46.08 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2246 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	IO-540-AE1A5
Registered Owner:	D & C Aviation Llc	**Rated Power:**	245 Horsepower
Operator:	D & C Aviation Llc	**Operating Certificate(s) Held:**	On-demand air taxi (135)

The helicopter's most recent inspection was a combined 2,200 hour overhaul, 100-hour, and annual inspection, completed on May 6, 2019. As part of this inspection, the engine was removed, overhauled, and reinstalled on the helicopter.

According to the helicopter's type certificate data sheet, the unusable fuel quantity was 1 gallon.

R44 Emergency Procedures

The pilot operating handbook for the helicopter, Section 3, Emergency Procedures, Power Failure – General, stated that an engine failure may be indicated by a change in noise level, nose left yaw, an oil pressure light, or decreasing engine rpm.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KFSM,449 ft msl	**Distance from Accident Site:**	36 Nautical Miles
Observation Time:	19:51 Local	**Direction from Accident Site:**	231°
Lowest Cloud Condition:	Few / 800 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 10000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	100°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.7 inches Hg	**Temperature/Dew Point:**	21°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Cass, AR	**Type of Flight Plan Filed:**	None
Destination:	Cass, AR	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	2 Fatal, 1 Serious	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	3 Fatal, 1 Serious	**Latitude, Longitude:**	35.705276,-93.794998

The helicopter impacted a densely wooded area of the Ozark National Forest and came to rest between trees on its right side. The tailboom was fractured and bent to the right but remained attached via the tail rotor drive shaft. Damage to the helicopter was consistent with an impact with trees in a nose-low right bank. Several large branches at the site displayed cuts and a tree trunk exhibited 45° slash marks. About 5 gallons of fuel was drained from the fuel tank. Fuel collected at the firewall gascolator appeared clean and free of contaminants. The gascolator filter was clear of debris.

All main rotor blade and tail rotor linkages remained secured. Flight control continuity was confirmed from the cockpit controls to the swash plate to the blade pitch change links. Continuity of the main rotor drive system was confirmed by manually rotating the main rotor blades. The frame tubing displayed impact marks from the engine belt pulley with no directional score marks on either surface. All engine drive belts remained in place and were not damaged. The attitude indicator displayed a right bank, and the airspeed indicator displayed about 88 knots. Several of the cockpit lights were impact damaged, of the remaining lights, the oil pressure warning light's filament was stretched. Examination of the airframe revealed no evidence of any preimpact anomalies.

Examination of the engine revealed no evidence of any preimpact anomalies. The fuel servo was removed and bench tested. No malfunctions were detected with the fuel servo.

Medical and Pathological Information

An autopsy was conducted on the pilot by the Arkansas State Crime Laboratory. The cause of death was multiple injuries and the manner of death was ruled an accident.

Toxicology testing was conducted by the FAA Forensic Sciences Laboratory. Testing was negative for carbon monoxide, cyanide, and ethanol. Hydroxychloroquine was detected in blood and in the liver.

Administrative Information

Investigator In Charge (IIC):	Aguilera, Jason
Additional Participating Persons:	Shane Benedetto; FAA FSDO; Little Rock, AR Thom Webster; Robinson Helicopters; Torrence, CA Troy Helgeson; Lycoming Engines
Original Publish Date:	February 9, 2022
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99538