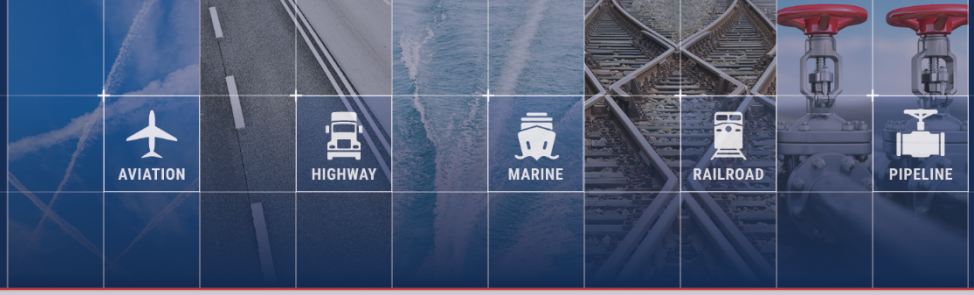

Aviation Investigation Final Report

Location:	Eagle Lake, Texas	**Accident Number:**	CEN24LA271
Date & Time:	July 16, 2024, 00:55 Local	**Registration:**	N609RP
Aircraft:	McDonnell Douglas Helicopter 600N	**Aircraft Damage:**	Destroyed
Defining Event:	Sys/Comp malf/fail (non-power)	**Injuries:**	1 Serious, 4 Minor, 1 None
Flight Conducted Under:	Public aircraft		

Analysis

The operator was providing flight services to law enforcement for training purposes at the time of the accident. The pilot stated that during the last flight of the evening, he flew the helicopter at a low altitude and at a low airspeed when the helicopter exhibited low rotor rpm. The helicopter lost partial engine power, and the pilot performed a forced landing. The helicopter was destroyed by impact forces.

Postaccident examination of the helicopter revealed the helicopter's fuel system was incorrectly installed and drew fuel from the forward portion of the left fuel cell, allowing air to be drawn into the fuel system when the fuel level reached an unsustainable level for engine operation. A correct installation of the fuel system would have had fuel being drawn from the aft portion of the left fuel tanks, which had about 19.5 gallons of fuel available.

Maintenance entries showed that the pilot, who was also a mechanic, performed recent maintenance within the left fuel cell and such maintenance would have required the pilot to remove and visually inspect the fuel system components within the left fuel cell that were found to be improperly installed. The improper installation resulted in the fuel system not scavenging the available fuel from the aft portion of the left fuel cell.

Probable Cause and Findings

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

The operator’s improper installation of the fuel system, which resulted in fuel starvation, a loss of engine power, and impact with terrain.

Findings

Personnel issues	Installation - Maintenance personnel
Aircraft	Fuel - Fluid level

Factual Information

History of Flight

Prior to flight	Aircraft maintenance event
Maneuvering-low-alt flying	Sys/Comp malf/fail (non-power) (Defining event)
Maneuvering-low-alt flying	Fuel starvation
Landing	Collision with terr/obj (non-CFIT)

On July 16, 2024, at 0055 central daylight time, a McDonnell Douglas Helicopter 600N, N609RP, was destroyed when it was involved in an accident near Eagle Lake, Texas. The commercial pilot was uninjured, one passenger received serious injuries, and four passengers received minor injuries. The helicopter was operated as a public use flight for law enforcement training.

The operator was providing flight services for law enforcement training at the time of the accident. The pilot, who was employed by the operator, stated that during the last flight of the evening, he flew the helicopter at an altitude of about 60 ft above ground level and at a speed of about 20 kts. He said that during the flight, he heard a bang, and the helicopter exhibited low rotor rpm and a partial loss of engine power. The pilot performed an autorotation, during which the helicopter was destroyed due to impact with terrain. The helicopter sustained damage to the fuselage, main rotor, and tailboom.

The McDonnell Douglas Helicopter 600N has left and right fuel cells equipped with a baffle that separated the forward and aft portions of each fuel cell. The baffles are several inches in height but do not extend to the top of their respective fuel cells. Each baffle has a one-way flapper valve that allows fuel to flow from the forward portion to the aft portion of the fuel cell. Fuel is drawn from the left aft fuel cell. A start pump/boost pump is installed in the aft portion of the left fuel cell, which is also used in emergency procedures. Cross-feed tubes, a scavenge line, and a one-way flapper valve are installed to ensure the aft portion of the left fuel cell is continuously full of fuel so it can be supplied to the engine through suction for the engine-driven fuel pump.

During recovery of the helicopter from the accident site, the only fuel recovered was about 19.5 gallons of fuel from the aft portion of the left fuel cell. Postaccident examination of the helicopter's fuel system revealed that the that the installation drew fuel from the forward portion of the left fuel cell, rather than the rear portion. The fuel start/boost pump was not present and the electrical wires leading to the fuel start/boost pump had been cut and its loose ends were zip-tied.

A download of recorded engine data was performed, followed by an examination of the engine and engine accessories. Engine control unit (ECU) data showed the ECU commanding the fuel metering valve to full open in response to declining main rotor speed. ECU data showed a reduced fuel flow to the engine until the helicopter impacted terrain.

The pilot held a mechanic certificate with airframe and powerplant ratings and held inspection authorization. A review of maintenance logbook entries showed that the most recent maintenance of the helicopter's fuel system was performed by the pilot and was dated July 10, 2024, for the installation of forward and aft fuel probes. The helicopter's Illustrated Parts Catalog shows that the fuel probes are in the forward and aft portions of the left fuel tank.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	64,Male
Airplane Rating(s):	Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	4-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 26, 2024
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 22, 2022
Flight Time:	16800 hours (Total, all aircraft), 610 hours (Total, this make and model), 16755 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	McDonnell Douglas Helicopter	**Registration:**	N609RP
Model/Series:	600N	**Aircraft Category:**	Helicopter
Year of Manufacture:	1997	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	RN009
Landing Gear Type:	Skid	**Seats:**	7
Date/Type of Last Inspection:	July 10, 2024 100 hour	**Certified Max Gross Wt.:**	3700 lbs
Time Since Last Inspection:		**Engines:**	1 Turbo shaft
Airframe Total Time:	2590 Hrs at time of accident	**Engine Manufacturer:**	Rolls Royce
ELT:		**Engine Model/Series:**	250-C47M
Registered Owner:	RONALD A PETERSON INC DBA	**Rated Power:**	650 Horsepower
Operator:	Last Shadow	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	ELA,184 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	00:55 Local	**Direction from Accident Site:**	90°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	23°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Eagle Lake, TX	**Type of Flight Plan Filed:**	None
Destination:	Eagle Lake, TX	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Serious, 4 Minor	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 4 Minor, 1 None	**Latitude, Longitude:**	29,-96(est)

Administrative Information

Investigator In Charge (IIC):	Gallo, Mitchell
Additional Participating Persons:	Phillip Powell; Federal Aviation Administration, Houston FSDO; Houston, TX Jack Johnson; Rolls Royce; Indianapolis, IN
Original Publish Date:	February 26, 2025
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=194714