Aviation Safety Investigation Report 199503059

Robinson Helicopter Co R22

15 September 1995

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Aviation Safety Investigation Report

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The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

Occurrence Number: 199503059 **Occurrence Type:** Accident
Location: 117 km SSW Marble Bar, Aerodrome
State: WA **Inv Category:** 4
Date: Friday 15 September 1995
Time: 1400 hours **Time Zone** WST
Highest Injury Level: None

Aircraft Manufacturer: Robinson Helicopter Co
Aircraft Model: R22
Aircraft Registration: VH-UXH **Serial Number:** 0137
Type of Operation: Non-commercial Aerial Mustering
Damage to Aircraft: Substantial
Departure Point: Hillside Outcamp, WA
Departure Time: 1200 WST
Destination: Hillside Outcamp, WA

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	Private	1319.0	2433

Approved for Release: Friday, February 16, 1996

Circumstances

The aircraft was on an approach to land, and passing through 120 ft at 70 kts when the engine suddenly stopped. The pilot immediately entered an autorotational descent however, he misjudged the landing flare and the aircraft landed heavily.

The engine started and ran normally, when it was checked following the accident. Fifteen litres of fuel was recovered from the fuel tank. The aircraft was being operated on unleaded automotive petrol at the time of the accident. A flight manual supplement had been issued which permitted the aircraft to be operated on super grade automotive petrol (commonly referred to in the aviation industry as Mogas) as an alternative to aviation fuel.

The pilot reported that he had been operating at low level in 35-38 degree temperatures for two hours prior to the stoppage. It is suspected that the temperature of the fuel remaining in the tank, which is located next to the engine and exposed to the sunlight, had increased to the point where fuel vaporisation occurred causing fuel starvation and engine stoppage.

Additional safety information

Although not a factor in this accident the reported use of unleaded petrol where only super grade petrol had been approved as an alternative to aviation fuel indicated a possible systemic safety deficiency. It became apparent following discussion with the industry that there is a lack of understanding of the difference between unleaded and super grade petrol and that unleaded petrol could be in widespread use in aircraft.

Super grade petrol is more expensive than unleaded petrol and is becoming the alternative rather than the normal fuel for motor vehicles. There have also been changes in the methods used to supply fuel to pastoral properties which increases the cost of maintaining a secondary stock of super grade fuel. Consequently, many private operators no longer keep a stock of super grade fuel for use in their own or visiting aircraft. These factors have probably led to the use of unleaded petrol as an alternative to aviation fuel. The use of the generic term Mogas to describe automotive fuel may further complicate the issue as it does not differentiate between unleaded or super grade petrol. Although the flight manual supplement indicates that only super grade petrol may be used as an alternative to aviation fuel there is no warning that use of unleaded petrol is not approved.

Both aviation fuel and super grade petrol contain lead which facilitates upper cylinder lubrication including lubrication of the valve guides. Unleaded petrol uses a different process and unless the engine has been designed to operate on unleaded petrol the lubrication that is available may be insufficient to prevent damage to the valves.