



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Ref No.	CA18/2/3/8327	
Aircraft Registration	ZS-RHI	Date of Accident	10 July 2007		Time of Accident	1000Z
Type of Aircraft	ROBINSON R22	Type of Operation		Private		
Pilot-in-command Licence Type	Private (Helicopter)	Age	40	Licence Valid	Yes	
Pilot-in-command Flying Experience	Total Flying Hours	1 046.5		Hours on Type	784.7	
Last point of departure	Bergtop farm, Waterpoort, Limpopo					
Next point of intended landing	Hoedspruit Aerodrome (FAHS), Limpopo					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
20 nm east of Louis Trichardt in the Soutpansberg gorge (GPS co-ordinates: S22°'59.31 E029° 38.32)						
Meteorological Information	Surface wind at 070° at 3 kts, temperature, 17°C, CAVOK					
Number of people on board	1 + 1	No. of people injured	0 + 1	No. of people killed	0	
Synopsis	<p>The pilot was accompanied by a passenger on a private flight from the Bergtop farm in the Waterpoort area to Hoedspruit. According to the pilot, he departed with full tanks. He planned to drop the passenger (his 16-year-old nephew) at Klaserie Game Reserve en route to Hoedspruit. As the weather was fine, he took a direct route across the escarpment and applied carburettor heat.</p> <p>After flying for approximately 35 minutes and whilst cruising at about 80 kts at 1 000 ft above ground level (AGL), the pilot suddenly experienced a total loss of engine power. He had to commit to execute an emergency landing in mountainous terrain, and attempted an auto-rotational landing in a valley as other areas were very steep and rocky. He managed to maintain revolutions per minute (RPM) and airspeed, and flared the helicopter, reducing the rate of descent and speed. The helicopter mushed into a tree on impact, which cushioned the impact forces. The pilot immediately helped the passenger to exit the helicopter as the passenger had sustained a fractured ankle and fuel had started dripping from the fuel tanks.</p> <p>The pilot was not injured. Apart from the fractured ankle, the passenger sustained only minor injuries. The helicopter was substantially damaged.</p>					
Probable Cause						
No possible reason could be found for the engine to stop/fail during flight.						
IARC Date				Release Date		



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : JENRUS Helicopters (Pty) Ltd.
Manufacturer : Robinson Helicopter Company
Model : R22
Nationality : South African
Registration Marks : ZS-RHI
Place : 20 nm east of Louis Trichardt
Date : 10 July 2007
Time : 1000Z

All times given in this report are co-ordinated universal time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus two hours.

Purpose of the Investigation:

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997), this report was compiled in the interests of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability.***

Disclaimer:

This report is given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight:

- 1.1.1 The pilot was accompanied by a passenger on a private flight from Bergtop farm in the Waterpoort area to Hoedspruit. According to the pilot, he departed with the fuel tanks filled to full capacity. He planned to drop the passenger (his 16-years-old nephew) at Klaserie Game Reserve en route. As the weather conditions were fine, he took a direct route across the escarpment and applied carburettor heat.
- 1.1.2 After flying for approximately 35 minutes and whilst cruising at about 80 kts at 1 000 ft AGL, the pilot suddenly experienced a total loss of engine power without any warning. He was committed to execute an emergency landing in mountainous terrain, and attempted an auto-rotational landing in a valley/gorge as other areas were very steep and rocky. He managed to maintain RPM and airspeed, and flared the helicopter, reducing the rate of descent and speed. The helicopter mushed into a tree on impact, which cushioned the impact forces. The pilot immediately helped the passenger to exit the helicopter as the passenger had sustained a fractured ankle and fuel had started dripping from the fuel tanks.

1.1.3 After the pilot had assisted and attended to the passenger, he climbed up the mountainside to obtain a cellular signal in order to contact search and rescue for assistance. Search and rescue responded immediately by helicopter.



Figure 1: The police helicopter flying over steep and rocky terrain near the site

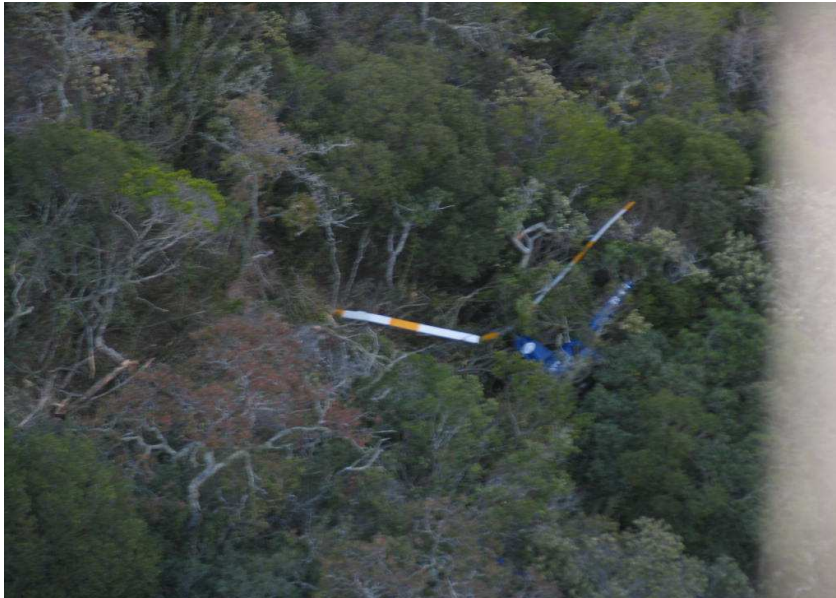


Figure 2: Aerial view of the helicopter wreckage in trees



Figure 3: The helicopter mashed into trees



Figure 4: The helicopter wreckage, extensively damaged on impact with trees

1.2 Injuries to Persons:

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	1	-
None	1	-	-	-

1.2.1 The pilot sustained no injuries. Apart from a fractured ankle, the passenger sustained only minor injuries.

1.3 Damage to Aircraft:

1.3.1 The helicopter fuselage, main rotor blades, tail rotor blades, landing skids and airframe were extensively damaged during the impact sequence.

1.4 Other Damage:

1.4.1 There was limited damage caused to vegetation on the ground during the impact.

1.5 Personnel Information:

1.5.1 Pilot-in-command:

Nationality	South African	Gender	Male	Age	40
Licence Number	*****	Licence Type	Private (Helicopter)		
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	10 March 2009				
Restrictions	None				
Previous Accidents	None				

1.5.1 Pilot-in-command Flying Experience:

Total Hours (Helicopters)	1 046.5
Total Past 90 Days	12.0
Total on Type Past 90 Days	12.0
Total on Type	784.7

1.6 Aircraft Information

1.6.1 Airframe:

Type	Robinson R22	
Serial Number	0129	
Manufacturer	Robinson Helicopter Company	
Year of Manufacture	1996	
Total Airframe Hours (At Time of Accident)	3 659.4	
Last MPI (Hours & Date)	3 603.0	6 June 2007
Hours Since Last MPI	56.4	
C of A (Issue Date)	13 August 1996	
C of A (Expiry Date)	12 August 2007	
C of R (Issue Date) (Present Owner)	05 March 2007	
Operating Categories	Standard	

1.6.2 Engine:

Type	Lycoming O 360 B2C
Serial Number	L14716-39A
Hours Since New	3 659.4
Hours Since Overhaul	1 062.7

1.6.3 Weight and Balance:

With the pilot and a passenger (16 years old) and approximately 15 US gallons of fuel remaining on board the aircraft at the time of the accident, the aircraft weight was well below the maximum weight for the aircraft type.

1.7 Meteorological Information

1.7.1 According to the South African Weather Services report, the weather conditions at the time of the accident were as follows:

Wind Direction	70° TN	Wind Speed	3 kts	Visibility	Good
Temperature	17°C	Cloud Cover	None	Cloud Base	None
Dew Point	N/A				

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with the standard navigational equipment as per the minimum equipment list approved by the Regulator. There were no recorded defects reported prior to the accident.

1.9 Communications

1.9.1 The aircraft was equipped with one very high frequency (VHF) radio that was approved by the regulator.

1.9.2 The accident happened outside a control zone (CTR) area.

1.10 Aerodrome Information

1.10.1 The helicopter departed from Bergtop private farm in the Waterpoort area to Hoedspruit in the Limpopo district.

1.11 Flight Recorders

1.11.1 The helicopter was not fitted with a cockpit voice recorder (CVR) or a flight data recorder (FDR), and neither was required to be fitted according to regulations.

1.12 Wreckage and Impact Information

1.12.1 The pilot was flying in an easterly direction when he executed an auto-rotational landing in a valley/gorge in the Makhado mountains near Louis Trichardt in the Limpopo district. The helicopter mashed into some trees. The rear section of the tail boom broke off during the impact sequence. The tail rotor separated from the tail boom and could not be located at the accident site.



Figure 5: The helicopter in the trees in the valley



Figure 6: The main wreckage and damage sustained

1.13 Medical and Pathological Information

1.13.1 The pilot and passenger were properly restrained by the safety harnesses. The pilot escaped without any injuries. The passenger sustained minor injuries and a fractured ankle.

1.14 Fire

1.14.1 There was no pre- or post-impact fire.

1.15 Survival Aspects

1.15.1 The accident was survivable. The pilot and passenger were properly restrained with three-point safety harnesses. The pilot mused the helicopter into trees and due to fairly low impact forces, the occupants survived the accident.

1.16 Tests and Research

1.16.1 The engine was recovered to an approved engine overhaul facility for an engine strip-down and tests.

1.16.1.1 The four cylinders were removed from the engine and valve leak checks were performed and found satisfactory. No leaks were evident.

1.16.1.2 The spark plugs were tested and found satisfactory in all respects.

1.16.1.3 All cylinder barrels were measured and found to be within the manufacturer's specifications.

1.16.1.4 The inlet and exhaust valve clearances were measured and inspected. No abnormalities and no excessive carbon build-up or wear were found.

1.16.1.5 The piston and rings were examined and found to be normal.

1.16.1.6 The crankcase was stripped and examined. No anomalies or any part failures or faulty workmanship that could have caused the engine to fail or the loss power were found.

1.16.1.7 The engine was received in a bare condition excluding the components and extensively damaged oil sump. As a result, the engine could not be test run.

1.17 Organisational and Management Information

1.17.1 This was a private flight that was flown by the pilot, who was in possession of a private helicopter licence.

1.17.2 The last mandatory periodic inspection (MPI) was carried out on the helicopter by an approved maintenance organisation (AMO) on 06 June 2007 at 3 603.0 airframe hours. The AMO was in possession of a valid AMO Approval Certificate at the time.

1.18 Additional Information

1.18.1 None.

1.19 Useful or Effective Investigation Techniques

1.19.1 None considered necessary.

2. ANALYSIS

2.1 The pilot, accompanied by a passenger, was on a private flight from the Bergtop farm in the Waterpoort area to Hoedspruit. According to the pilot, he departed with full tanks. He planned to drop the passenger (his 16-years-old nephew) at Klaserie Game Reserve en route to Hoedspruit. As the weather was fine, he took a direct route across the escarpment and applied carburettor heat.

- 2.2 After flying for approximately 35 minutes and whilst cruising at about 80 kts at 1 000 ft AGL, the pilot reported that the engine suddenly stopped without any indication of a loss of power. He was committed to execute an emergency landing in mountainous terrain, and attempted an auto-rotational landing, flaring the helicopter, reducing the rate of descent and speed. The helicopter mushed into a tree on impact, which lessened the impact forces. After the helicopter came to rest, the pilot immediately helped the passenger to exit the helicopter as he sustained a fractured ankle. The pilot then climbed up the mountainside and contacted search and rescue for assistance.
- 2.3 The engine was recovered to an approved engine overhaul facility for teardown and examination. There was no evidence found of any mechanical defect or failure that could have contributed to the engine stopping.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot was the holder of a valid private pilot's licence on helicopters and the helicopter type was endorsed in his logbook.
- 3.1.2 The last mandatory periodic inspection (MPI) prior to the accident was certified on 06 June 2007 by an approved aircraft maintenance organisation (AMO) at 3 603.0 airframe hours.
- 3.1.3 The helicopter had flown a further 56.4 hours since the last MPI was certified.
- 3.1.4 The weather conditions were reported to be fine with no clouds. The surface temperature was approximately 17°C with the surface wind 070° at 3 kts.
- 3.1.5 According to the pilot's questionnaire, the engine suddenly stopped without any warning or indication of a loss of power.
- 3.1.6 The engine was recovered to an engine overhaul facility for disassembly and examination. The engine was examined and no mechanical defects were found evident.
- 3.1.7 This was a private flight.
- 3.1.8 The pilot carried out an auto-rotational landing in bushy terrain. The helicopter mushed into trees and was extensively damaged.

3.2 Probable Cause/s

- 3.2.1 Undetermined.

3.3 Contributory factor/s

- 3.3.1 None.

4. SAFETY RECOMMENDATIONS

4.1 None.

5. APPENDICES

5.1 None

Report reviewed and amended by the Advisory Safety Panel on 16 February 2010
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