



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8301	
Aircraft Registration	ZS-RLY	Date of Accident	23 May 2007		Time of Accident	1410Z
Type of Aircraft	R22 Beta II helicopter		Type of Operation	Private		
Pilot-in-command Licence Type		Commercial pilot	Age	42	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	1 553.4		Hours on Type	1 553.4
Last point of departure		Mpofu Safari Lodge, 60 km north of Lephalale, Northern Province				
Next point of intended landing		Mpofu Safari Lodge, 60 km north of Lephalale, Northern Province				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Next to the Mogol River at Mpofu Safari Lodge, 60 km north of Lephalale						
Meteorological Information		Wind: 330°TN/10 kts; Temperature: 18°C; Visibility: 10 km				
Number of people on board	1 + 1	No. of people injured	0	No. of people killed	2	
Synopsis						
<p>At approximately 1400Z, the pilot, accompanied by a passenger, took off from Mpofu Safari Lodge to look for an antelope that had been injured the previous day.</p> <p>Whilst the helicopter was flying over the Mogol River in close proximity to the ground, it struck a barbed wired fence and thereafter impacted with the ground, fatally injuring both occupants.</p>						
Probable Cause						
<p>The helicopter's tail rotor struck a 3-foot high barbed wire fence during a low-level flight and the helicopter impacted with the ground.</p>						
IARC Date				Release Date		



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Helicopter Surveillance Services
Manufacturer : Robinson Helicopters
Model : R22 Beta II
Nationality : South African
Registration Marks : ZS-RLY
Place : Mpofu Safari Lodge
Date : 23 May 2007
Time : 1410Z

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 2 hours.

Purpose of the Investigation

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interest 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 On 23 May 2007 at approximately 1400Z, the pilot and his passenger – a professional hunter – took off from Mpofu Safari Lodge to look for an antelope that the hunter had injured the previous day.
- 1.1.2 A farm worker saw the helicopter flying up and down the Mogol River. According to him, the aircraft suddenly pitched up high into the air, circled, and then crashed.
- 1.1.3 The worker reported the accident to a colleague of the pilot. They began a search and found the helicopter in reeds next to the river.
- 1.1.4 The accident occurred in daylight at the position South 23° 25 004 East 027° 42 076 at an elevation of approximately 2 585 feet above mean sea level.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

- 1.3.1 The helicopter sustained substantial damage to the main rotor blades, cabin, skids, tail boom and rotor.



Figure 1. Rear view of the wreckage.



Figure 2. The extensive damage to the cabin.

1.4 Other Damage

1.4 The 3-foot barbed wire fence across the Mogol River was damaged by the impact.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	42
Licence Number	#####	Licence Type	Commercial Pilot		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Cull Rating				
Medical Expiry Date	30 June 2007				
Restrictions	None				
Previous Accidents	<ol style="list-style-type: none">1. On 2 September 2002, the pilot had a hard landing in an R22 helicopter.2. On 20 November 2002, the pilot had a hard landing after an autorotation due to contaminated fuel in an R22 helicopter.3. On 25 September 2003, the pilot experienced a loss of tail rotor effectiveness in an R22 helicopter.				

Flying Experience

Total Hours as on 9 May 2007	1 553.4
Total Past 90 Days	79.19
Total on Type Past 90 Days	79.19
Total on Type as on 9 May 2007	1 553.4

1.6 Aircraft Information

Airframe

Type	Robinson R22 Beta II	
Serial Number	3082	
Manufacturer	Robinson Helicopter Company	
Year of Manufacture	2000	
Total Airframe Hours (at time of accident)	1 561.7	
Last MPI (Hours & Date)	1 469.8	30 January 2007
Hours since Last MPI	91.9	
C of A (Issue Date)	6 August 2004	
C of A (Expiry Date)	5 August 2007	
C of R (Issue Date) (Present Owner)	14 August 2002	
Operating Categories	Standard	

Engine

Type	Lycoming O-360-J2A
Serial Number	L-37373-36A
Hours since New	1 469.8
Hours since Overhaul	TBO not reached

1.7 Meteorological Information

- 1.7.1 The official weather report obtained from the South African Weather Services reported the following weather conditions on the day of the accident:

Surface analysis:

A high pressure system was present over the southern part of the country with a trough of low pressure stretching from KZN over Gauteng into Botswana.

Upper air analysis:

There was a trough in the upper air south-east of the country. Strong south-westerly winds were blowing over the country at 500 hPa (+/-18 000 ft AMSL)

Weather conditions in the vicinity of the accident:

Temperature	18°C
Wind direction	330° TN
Wind speed	10 kts
Cloud	No cloud
Freezing level	7 000 ft AMSL
Visibility	10 km

1.8 Aids to Navigation

- 1.8.1 The helicopter was equipped with an Airpath C-2400-L4-B compass and a Garmin 150XL GPS. There were no recorded or reported defects experienced with the navigation equipment.

1.9 Communications

- 1.9.1 The communication equipment installed in the helicopter was a King KY 197A VHF transceiver. There were no entries of defects experienced with the communication equipment.
- 1.9.2 There was no communication with Air Traffic Control (ATC) services as the helicopter was being operated outside of controlled airspace.

1.10 Aerodrome Information

- 1.10.1 The accident did not happen at or in close proximity to an aerodrome.
- 1.10.2 The accident occurred in reeds next to the Mogol River at the position S 23° 25.003 E027° 42.074. Elevation was 2 625 feet AMSL.

1.11 Flight Recorders

- 1.11.1 The helicopter was not fitted with a flight data recorder or a cockpit voice recorder as neither was required in terms of civil aviation regulations.

1.12 Wreckage and Impact Information

- 1.12.1 According to a witness, the helicopter was flying up and down the Mogol river. The witness then saw the helicopter suddenly pitch its nose up high into the air, circle, then plunge down and strike the ground.
- 1.12.2 The helicopter came to rest facing in a westerly direction with a nose-down attitude at the position S23° 25.003 E027° 42.074. The skids and the front lower fuselage area of the cabin collapsed on impact. The aft section of the tail boom separated from the helicopter and was found approximately 2 metres away from the main wreckage.
- 1.12.3 The helicopter impacted with a section of barbed wire fence at the position S23° 25 044 E27° 42 023 before pitching up into the air. The main wreckage was found 116 metres from where the helicopter struck the fence.
- 1.12.4 A piece of tail rotor blade was found at the position S23°25 021E027°42 043. A second piece of tail rotor was found at the position S23°25 025 E027°42 042. It was determined that the wreckage was in the direction 050.723° true north and 116 m from the fence.

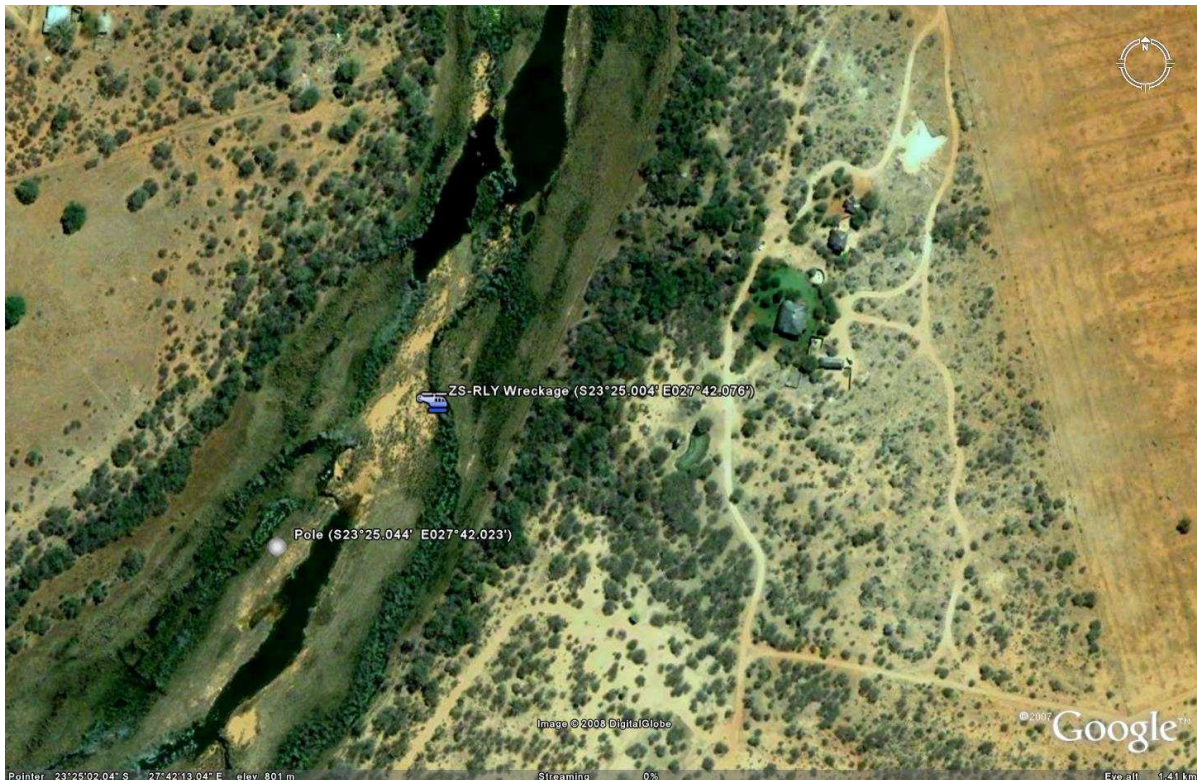


Figure 3. The wreckage site in relation to where the helicopter struck the barbed wire fence.

1.13 Medical and Pathological Information

- 1.13.1 A post mortem examination was performed on the deceased pilot and passenger after the accident.
- 1.13.2 The post mortem and toxicology test results were not available at the time this report was compiled. Should these be made available, an attachment will be added.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire.

1.15 Survival Aspects

1.15.1 The accident was considered non-survivable, due to the high impact forces. The cabin area caved in and both the pilot's and passenger's seats collapsed on impact with the ground. The occupants were found secured with three-point safety belts, which did not fail.

1.16 Tests and Research

1.16.1 The engine was removed from the airframe after the accident and subjected to a bench test at an approved engine facility. It was started and performed satisfactorily, and was therefore found not to have contributed to the accident.

1.16.2 On-site investigation

It was found that barbed wire had wound around the tail rotor. The helicopter had struck a 3-foot high barbed wire fence spanning the Mogol River.



Figure 4. The barbed wire entangled around the tail rotor.

Inspection of the wreckage revealed that all flight control surfaces were accounted for, as were all associated control linkages.

The cabin area had caved in, the skids had collapsed and the seats were badly damaged. The tail boom was severed and pieces of the tail rotor could not be found at the accident site. The main rotor blades were still attached to the helicopter but were bent in several places.

1.17 Organisational and Management Information

1.17.1 This was a private flight and the pilot was the owner of the helicopter.

1.17.3 According to available records, the aircraft maintenance organisation (AMO) that had certified the last MPI on the helicopter prior to the accident was in possession of a valid AMO approval – No.846 – with an expiry date of 31 January 2008.

1.18 Additional Information

1.18.1 The pilot, who was also the owner of the helicopter, had been notified in writing by the Civil Aviation Authority on 2 March 2007 that the certificate of registration was no longer valid and that if the change of ownership was not done within 14 days, the use of the aircraft was prohibited in terms of regulations 47.00.10(5).

No proof was found that the change of ownership was done. Therefore, in terms of Civil Aviation Regulations 47.00.10(5), the use of the helicopter was prohibited. However, no proof was found to indicate that the CAA had in fact grounded the helicopter after the new owner failed to do a change of ownership.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 Available information revealed that fine weather conditions prevailed in the area at the time of the flight and subsequent accident. The prevailing weather conditions therefore had no bearing on the accident.

2.2 The aircraft was properly maintained and, according to available documentation, did not reflect any defect or malfunction that could have contributed to or caused the accident. The post-crash inspection of the wreckage and engine indicated that the aircraft was intact prior to impact and the engine was operating normally.

2.3 The pilot was in possession of a valid commercial pilot's licence as well as a valid medical certificate at the time of the accident. He was rated to fly the helicopter.

2.4 Taking the farm worker's statement into account and the height of the barbed wire fence, the helicopter was flying at low level. It is the opinion of the writer that the pilot compromised the safety of the flight, as it could have been conducted at a higher altitude as stipulated in Part 91.06.32 pertaining to minimum heights. This writer also believes that the pilot might have seen the fence at a very late stage during the flight and attempted to avoid impact, but the tail rotor struck the wire which resulted in the helicopter's sudden pitch up into the air. The loss of the tail rotor rendered the helicopter uncontrollable, which is why it spun round in circles – a sight witnessed by the farm worker – and then crash.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot was the holder of a valid commercial pilot's licence and had the helicopter type endorsed in his logbook.
- 3.1.2 The pilot was the holder of a valid aviation medical certificate.
- 3.1.3 This was a private flight.
- 3.1.4 The aircraft was maintained in accordance with the approved maintenance schedule.
- 3.1.5 The helicopter held a valid certificate of airworthiness.
- 3.1.6 The new owner did not comply with Civil Aviation Regulations Part 47.00.10(1) and the helicopter was therefore not registered in the new owner's name.
- 3.1.7 Aircraft examination revealed no evidence of pre-impact failures or malfunctions with the airframe or the engine.
- 3.1.8 The aircraft was substantially damaged by the impact.
- 3.1.9 The AMO that certified the last mandatory periodic inspection prior to the accident was in possession of a valid AMO approval certificate from the CAA.
- 3.1.10 Weather conditions at the time of the accident were not considered to have had a bearing on the accident.
- 3.1.11 The pilot was flying low prior to the accident.

3.2 Probable Cause/s

- 3.2.1 The helicopter's tail rotor impacted with a 3-foot high barbed wire fence during a low-level flight, where after the helicopter impacted with the ground.

4. SAFETY RECOMMENDATIONS

- 4.1 None.

5. APPENDICES

- 5.1 None.

Report reviewed and amended by the Advisory Safety Panel 30 October 2009

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