



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8280	
Aircraft Registration	ZS-RMI	Date of Accident	5 April 2007		Time of Accident	0745Z
Type of Aircraft	Robinson R22 helicopter		Type of Operation	Training		
Pilot-in-command Licence Type		Commercial	Age	36	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	6 782,3		Hours on Type	2,9
Last point of departure		Grand Central Aerodrome (FAGC)				
Next point of intended landing		Grand Central Aerodrome (FAGC)				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
The garden of a private home: 100 East Hertford Road, Morningside, Johannesburg. The GPS position S26°04.008' E028° 03.081' at an elevation of 4 668 ft.						
Meteorological Information		Temperature: 21°C; Wind: 3 kt / 260°; Cloud: SCT at 4 000 ft; Visibility: 10 km				
Number of people on board	1 + 1	No. of people injured	0	No. of people killed	2	
Synopsis						
<p>The instructor and student pilot took off from Grand Central Aerodrome on a training flight, with the intention of returning to Grand Central after the session.</p> <p>Approximately half-an-hour later, eye-witnesses in Morningside, Johannesburg saw the helicopter flying slowly at a very high altitude. Suddenly the nose dropped and the aircraft plummeted. As it was descending, pieces appeared to be falling from it and the main rotor blades were observed to be rotating slowly. The helicopter crashed into the garden of a private home at 100 East Hertford Road, Morningside. Both the instructor and student pilot were fatally injured.</p> <p>The damage to the helicopter, trees and terrain at the accident site, as well as the witnesses' statements, all indicate that the helicopter was in a steep nose-down attitude as it struck the ground. For unknown reasons, the pilot seemed to have lost control in flight and was unable to recover.</p>						
Probable Cause						
Loss of control in flight due to undetermined reasons.						
IARC Date			Release Date			



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Helicopter Training Services
Manufacturer : Robinson Helicopter Company
Model : R22 Beta II
Nationality : South African
Registration Marks : ZS-RMI
Place : Morningside, Johannesburg
Date : 5 April 2007
Time : 0745Z

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 5 April 2007 at approximately 0745Z, the instructor and student pilot took off from Grand Central Aerodrome on a training flight, with the intention of returning to Grand Central after the session.
- 1.1.2 Approximately half-an-hour later, eye-witnesses in Morningside, Johannesburg saw the helicopter flying slowly at a very high altitude. Suddenly the nose dropped and the aircraft plummeted. As it was descending, pieces appeared to be falling from it and the main rotors were observed to be rotating slowly.
- 1.1.3 The helicopter crashed into the garden of a private home at 100 East Hertford Road, Morningside. Both the instructor and student pilot were fatally injured and the aircraft was destroyed.

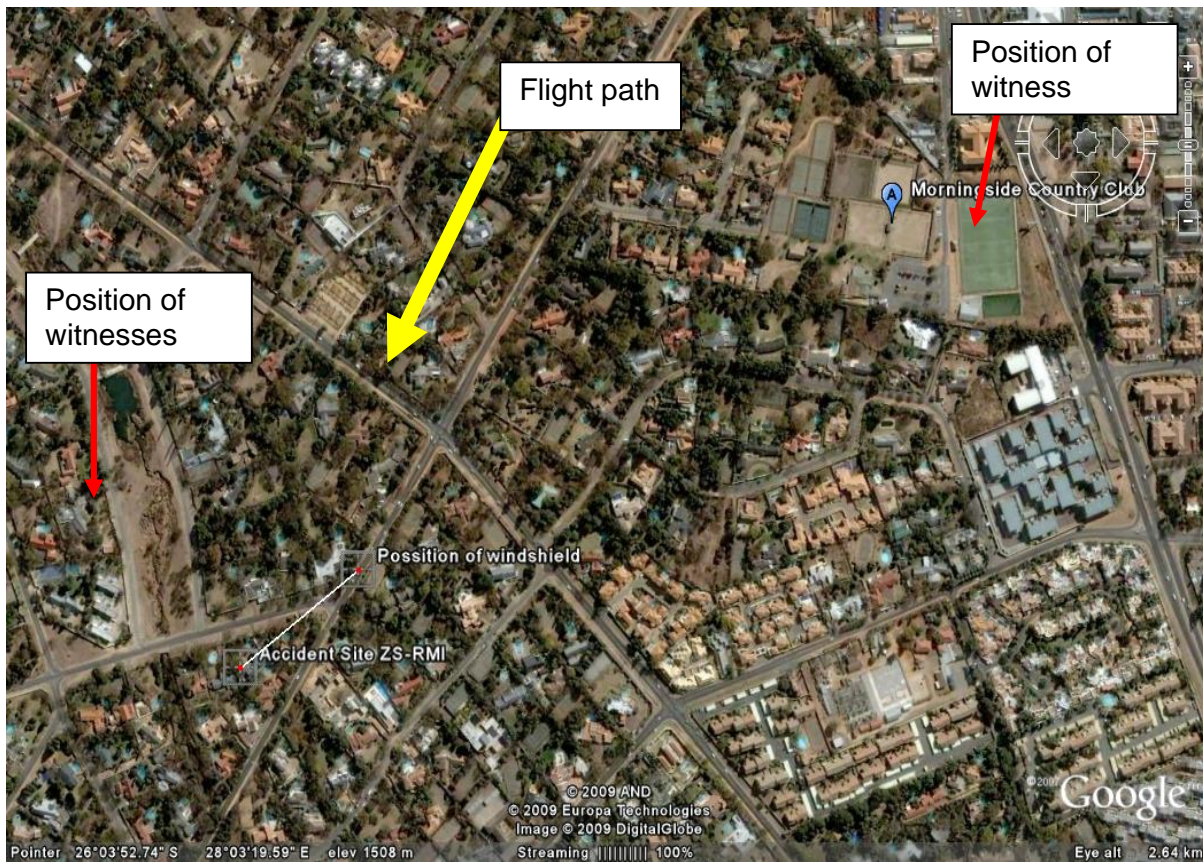


Figure 1. Google Earth image showing flight path, position of accident site and position of witnesses.

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 was destroyed in the accident.
Refer Figure 2 on following page.

1.4 Other Damage

1.4.1 There was minor damage to the vegetation in the garden.



Figure 2. The wreckage of the helicopter.

1.5 Personnel Information

1.5.1 Instructor:

Nationality	South African	Gender	Male	Age	36
Licence Number	*****	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instructor – Grade 3				
Medical Expiry Date	29 January 2008				
Restrictions	None				
Previous Accidents	None				

Flying Experience

Total Hours	6 782,3
Total Past 90 Days	163,6
Total on Type Past 90 Days	2,9
Total on Type	2,9

- The pilot had 6 182 hours on fixed wing aircraft and 600.3 hours on rotor wing.
- According to the records, the instructor completed his conversion from the Robinson R44 to the R22 and acquired his R22 instructor rating on the same day – 23 March 2007.
- It was also noted that the instructor had performed three separate training exercises, each with a different student, in the same helicopter, and no incidents were reported.

1.5.2 Student pilot:

According to his training file, the student had just started his private pilot's licence (PPL) training with the aviation training organisation (ATO). The accident flight was his second instructional flight. During his first, two days before, he covered familiarisation with the helicopter, pre- and post-flight actions, air experience and effects of controls. The duration of this first flight was 1,2 hours.

On the day of the accident, he was due to perform an attitude-change exercise. The duration of the flight was meant to be one hour. The accident occurred approximately 30 minutes into the flight.

1.6 Aircraft Information

Airframe

Type	Robinson R22 Beta II	
Serial Number	3130	
Manufacturer	Robinson Helicopter Company	
Year of Manufacture	2000	
Total Airframe Hours (at time of accident)	2 817	
Last MPI (Date & Hours)	28 February 2007	2 791,2
Hours since last MPI	25,8	
C of A (Issue Date)	29 November 2000	
C of R (Issue Date) (Present Owner)	13 July 2001	
Operating Categories	Standard	

Engine

Type	Lycoming O-360-J2A
Serial Number	L-37580-36A
Hours since New	3 021,9
Hours since Overhaul	1 021,9

- According to available information and records, the helicopter had a fuel uplift of 21 litres before the flight.

1.7 Meteorological Information

1.7.1 The weather conditions at the time and place of the accident were obtained from the South African Weather Services.

Wind direction	260°TN	Wind speed	3 kt	Visibility	10 km
Temperature	21°C	Cloud cover	SCT	Cloud base	4 000 ft
Dew point	09°C				

1.7.2 The meteorological conditions were suitable for visual flight, and were deemed not to have contributed to the accident.

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with standard navigation instruments as per the manufacturer's design. None was reported unserviceable prior to or during the accident.

1.9 Communications

1.9.1 The aircraft was equipped with standard communication systems and none was reported unserviceable prior to or during the accident.

1.9.2 The helicopter was operating in the General Flying Area, and the pilot broadcast his intentions on 122.8 MHz – the frequency in use at Grand Central Aerodrome.

1.9.3 The pilot made no emergency calls during the accident flight.

1.10 Aerodrome Information

1.10.1 The accident occurred in the garden of a private home at 100 East Hertford Road, Morningside, Johannesburg. The GPS position was determined to be S26°04.008' E028° 03.081' at an elevation of 4 668 ft.

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 by regulations to be fitted to this type of helicopter.

1.12 Wreckage and Impact Information

1.12.1 The helicopter fell in a nose-down attitude and crashed between trees before hitting the ground. It was destroyed on impact. During the on-site investigation, it was found that the windshield had separated from the helicopter before the crash. The windshield was found at GPS position S26° 03.953' E028° 03.161', 170 m from the wreckage..

1.12.2 The wreckage, with the exception of the windshield, was contained within a small impact area.

1.12.3 The fuel tank was found ruptured, and damage to the grass at the impact site indicated a significant amount of fuel spillage.

1.13 Medical and Pathological Information

1.13.1 A post mortem examination was performed on the deceased pilot and passenger after the accident. The results of the post mortem report and toxicology tests were not available at the time the report was compiled. Should any of the results once received indicate that medical aspects may have affected the performance of the

flight crew members, this will be considered as new evidence and the investigation re-opened.

1.14 Fire

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

1.15 Survival Aspects

1.15.1 The high impact forces caused the destruction of the cabin. The accident was considered non-survivable.

1.16 Tests and Research

1.16.1 Airframe:

- The wreckage was removed from the accident site to the South African Police Services Air Wing hangar at Wonderboom Aerodrome for further investigation. A wreckage reconstruction (see Figures 3 and 4 below) was performed to account for all the components, determine the failure modes and ascertain whether there was any possibility of in-flight breakage of the helicopter.
- During on-site investigation one of the main rotor blades was found broken, and the witness marks on the trees suggested that the main rotor was turning on impact. Further wreckage examination also revealed that the drive belts were intact.
- The airframe and its systems were inspected and all failures observed showed evidence of damage due to the accident sequence. None of the systems inspected showed signs of any pre-existing failure prior to the accident.



Figure 3. The wreckage during reconstruction – side view.



Figure 4. The wreckage during reconstruction – front view.

1.16.2 Engine:

- The helicopter engine was removed and taken to an approved engine overhaul facility to determine whether there had been any engine malfunction or failure. A complete engine teardown inspection was conducted, and it was found that all noted damage was consistent with that of accident damage; there was no evidence to suggest that the engine might have failed or malfunctioned prior to the accident.

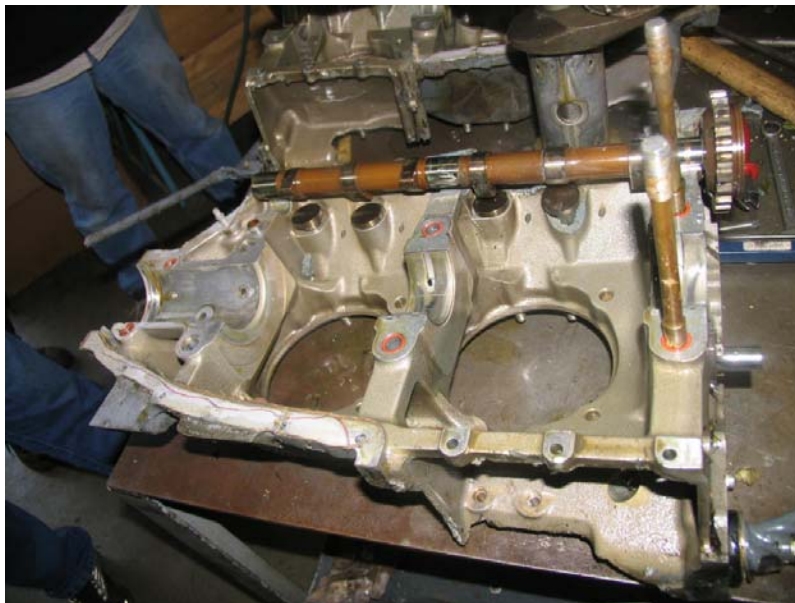


Figure 5. The engine parts during the teardown inspection.

1.17 Organisational and Management Information

1.17.1 This was a training flight.

1.17.2 The ATO was duly authorised to conduct training and was in possession of a valid aviation training approval issued in terms of Part 141.03.3 of the Civil Aviation Regulations of 1997.

1.18 Additional Information

1.18.1 According to witness statements the engine was running up until impact and the strip down analysis also found that all noted damage was consistent with that of accident damage; there was no evidence to suggest that the engine might have failed or malfunctioned prior to the accident.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 On 5 April 2007, at approximately 0745Z, the instructor and student pilot took off from Grand Central Aerodrome on a training flight, with the intention of returning to Grand Central after the session.

2.2 About half-an-hour later, eye-witnesses in Morningside, Johannesburg saw the helicopter flying slowly at a very high altitude. Suddenly, its nose dropped and the aircraft fell to the ground in a nose-down attitude. A witness also mentioned that he observed the main rotor rotating very slowly.

2.3 Meteorological conditions at the time of the accident were suitable for visual flight, and it was determined that weather did not contribute to the accident.

2.4 The examination of the wreckage and engine did not disclose any evidence of a pre-existing airframe defect, engine malfunction or system deficiency which could have caused or contributed to the accident. All damages observed were the result of impact forces caused by the crash.

2.5 The damage to the helicopter, the trees and the terrain at the accident site, as well as the witnesses' statements, all indicate that the helicopter was in a steep nose-down attitude as it struck the ground. For unknown reasons, the pilot seemed to have lost control of the helicopter in flight and was unable to recover.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot was a holder of a valid commercial pilot's licence (helicopter).
- 3.1.2 This was the student pilot's second training flight.
- 3.1.3 The aircraft had a valid airworthiness certificate.
- 3.1.4 Weather conditions were reported to be fine; with the prevailing wind being 260° at 3 kt. Weather was not a factor in the accident.
- 3.1.5 The accident occurred in daylight conditions.
- 3.1.6 The helicopter was certified, equipped and maintained in accordance with regulations and approved procedures.
- 3.1.7 There was no evidence of pre-impact failure or malfunction of the helicopter's structure, powerplant, flight controls or other systems.
- 3.1.8 Witness statements and the evidence gathered at the crash site indicate that the helicopter was not under control when it impacted the ground.

3.2 Probable Cause/s

- 3.2.1 Loss of control in flight for undetermined reason.

4. SAFETY RECOMMENDATIONS

- 4.1 None.

5. APPENDICES

- 5.1 None.

Report reviewed and amended by the Advisory Safety Panel 16 November 2010.

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