



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8566	
Aircraft Registration	ZS-RMJ	Date of Accident	21 October 2008	Time of Accident	1030Z	
Type of Aircraft	Robinson R22 Beta II (Helicopter)		Type of Operation	Training		
Pilot-in-command Licence Type		Commercial	Age	35	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	1102.8		Hours on Type	358.9
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)						
Open area next to Grand central Aerodrome, GPS Position: S25°59.380' E28°08.035' Elevation, 5325						
Meteorological Information		Visibility, Good, No Clouds, Temperature, 25° Wind, 3-9 knots.				
Number of people on board	1 + 1	No. of people injured	0	No. of people killed	0	
Synopsis						
<p>The instructor and a licensed student pilot embarked on a training flight with the intention to conduct autorotation and flaring exercises at Grand Central Aerodrome (FAGC) general flying area South of Allandale road. The helicopter was refuelled to full capacity prior to the flight. They took off from FAGC, using runway 35 routing towards the south of Allandale road. He then flew to an altitude of 6000 feet above ground level (AGL).</p> <p>The student pilot then descended to 6 feet above ground level at an open boundary outside FAGC where he flared in auto rotation. While busy with the exercise, the helicopter impacted an ant hill on the ground. The student pilot lost control, yawed to the left and impacted the ground heavily on the skid. The tail rotor, the empennage and the tail rotor gearbox separated from the tail boom. The tail rotor, the skid, the main rotor blades and the tail boom were damaged.</p>						
Probable Cause						
Tail rotor impacted an ant hill during a low level flight.						
Contributory Cause/s:						
Failure of the instructor and the student to look out.						
IARC Date				Release Date		

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Helicopter Training Services
Manufacturer : Robinson Helicopter Company
Model : R22 Betta II
Nationality : South African
Registration Marks : ZS-RMJ
Place : Open area outside Grand Central Aerodrome
Date : 21 October 2008
Time : 1030Z

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 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 On 21 October 2008, the instructor and the student pilot were involved in a training flight. The intention of the training flight was to conduct a flare and autorotation exercise at the Grand Central Aerodrome (FAGC) general flying area South of the Allandale road. The helicopter was refuelled to full capacity prior to flight.
- 1.1.2 The student pilot took off from FAGC using Runway 35 routing towards the South of Allandale road at 6000 feet. Both pilots initiated an auto rotation exercise on an open area outside FAGC.
- 1.1.3 The student pilot descended to 6 feet above the ground level (AGL) on a boundary outside FAGC, where he did an auto rotation exercise. Whilst busy with the exercise at 6 feet, the helicopter impacted an ant hill with the tail rotor. The pilot lost control of the tail rotor effectiveness and the helicopter yawed to the left and impacted the ground on the skid.
- 1.1.4 The helicopter skids, main rotor blades, the skids and the tail boom sustained substantial damages. The tail rotor gearbox and the empennage were detached from the helicopter tail boom. The tail rotor was damaged on impact with an ant hill.

1.2 Injuries to Persons:

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

1.3 Damage to Aircraft:

1.3.1 The helicopter was substantially damaged.



Photo 1: A view of the aircraft as it came to rest.

1.4 Other Damage:

1.4.1 There was no other damage.

1.5 Personnel Information:

1.5.1 Pilot in command.

Nationality	South African	Gender	Male	Age	35
Licence Type	Commercial	Licence Number	*****		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Grade 2 Helicopter Instructor and Instrument Rating				
Medical Expiry Date	30 June 2009				
Restrictions	None				
Previous Accidents	Nil				

Flying Experience:

Total Hours	1102.8
Total Past 90 Days	40.4
Total on Type Past 90 Days	252.3
Total on Type	358.9

1.6 Aircraft Information:

Airframe:

Type	Robinson R22 Beta II	
Serial Number	3131	
Manufacturer	Robinson Helicopter Company	
Year of Manufacture	2000	
Total Airframe Hours (At time of Accident)	3707.6	
Last MPI (Date & Hours)	16 October 2008	3699.0
Hours since Last MPI	8.6	
C of A (Issue Date)	27 July 2006	
C of R (Issue Date) (Present owner)	20 October 2000 (Present owner)	
Operating Categories	Standard	

Engine:

Type	Textron Lycoming/ O-360-J2A
Serial Number	BL-38200-36A
Hours since New	3652.7
Hours since Overhaul	49.9

Weight and balance:

Item	Weight	Longitudinal		Lateral	
		Arm	Moment	Arm	Moment
Aircraft	885.31	104.7	92691.96		
Pilot and Baggage	167.55	79	13236.42	10.7	1792.78
Passenger and Baggage	178.57	79	14107.24	-9.3	-1660.73
Empty weight	1231.43	97.5	1200035.61	0.1	132.06
Main fuel	57.60	108.6	6255.36	-11	-633.60
Auxiliary Fuel	15.75	103.8	1634.85	11.2	176.40
Total Take-off Weight	1304.78	98.0	127925.82	0.1	-193.09

- i. The maximum take-off weight for the helicopter according to the POH (Pilots Operating Hand Book) is 1371.27 lbs (622 kg). The helicopter was being operated within its weight limits.
- ii. The helicopter was being operated within its centre of gravity limitations as per POH.

1.7 Meteorological Information:

1.7.1 Weather information as obtained from the pilot questionnaire:

Wind direction	180°	Wind speed	3-9 knots	Visibility	Clear
Temperature	25°C	Cloud cover	None	Cloud base	None
Dew point	None				

1.8 Aids to Navigation:

1.8.1 The helicopter was fitted with standard navigation equipment for this helicopter type as approved at the time of certification.

1.9 Communications:

1.9.1 No difficulties with communication were known or reported prior to the accident and during flight.

1.9.2 The helicopter was fitted with a VHF radio.

1.9.3 The pilot broadcasted his intention on VHF frequency 122.8 MHz, which is the frequency used by Grand Central Aerodrome.

1.10 Aerodrome Information:

1.10.1 The helicopter took off from Grand Central Aerodrome with the intention to land back at the same Aerodrome after training.

1.10.2 The accident occurred outside the Grand Central boundary at GPS geographical position determined as S25°59.380' E028°08.35': Elevation, 5068.

Aerodrome Location	Grand Central	
Aerodrome Co-ordinates	S25°59'13.44" E028°08'25.97"	
Aerodrome Elevation	5325 feet	
Runway Designations	17/35	
Runway Dimensions	1724 x 23	
Runway Used	Runway 35	
Runway Surface	Asphalt	
Approach Facilities	PAPI's /Runway lighting	

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 impacted an ant hill with force whilst it was being operated at an altitude of 6 feet AGL damaging the tail rotor blades. The tail rotor gearbox and the empennage were detached from the tail boom. The skid, main rotor blades, and the tail boom sustained substantial damages. Photos below give the evidence of the wreckage at the accident side.



Figure 3: View of the empennage.



Figure 4: View of the ant hill.

1.13 Medical and Pathological Information:

1.13.1 The instructor and student sustained no injuries as result of this accident.

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 cockpit/ cabin remained intact during the accident sequence.

1.16 Tests and Research:

1.16.1 None.

1.17 Organisational and Management Information:

1.17.1 The ATO (Air Training Organisation Number 237) certificate was found to be invalid.

1.17.2 This was a training flight.

1.17.3 The last MPI (Mandatory Periodic Inspection) that was carried out on the Helicopter prior to the accident was certified on 16 October 2008 by AMO (Aircraft Maintenance Organisation) No 237. The person that certified the task held a valid approved person accreditation from the CAA as well as an AME (Aircraft Maintenance Engineer) licence.

1.18 Additional Information:

1.18.1 None.

1.19 Useful or Effective Investigation Techniques:

1.19.1 None.

2. ANALYSIS:

2.1 The instructor and the student pilot embarked on a training flight with the intention to conduct autorotation and flaring exercises at the general flying area South of Allandale road (FAGC) . The helicopter was refuelled to full capacity prior to the flight. The student pilot took off from FAGC using Runway 35 routing to the South of Allandale at 6000 feet. Both pilots initiated autorotation exercises on an open area outside Grand Central Aerodrome at 6ft AGL.

2.2 The student pilot descended to 6 feet above the ground on a boundary outside Grand Central Aerodrome where he did a flare in autorotation exercise. Whilst busy with the exercise at 6 feet (low altitude), both of the pilots failed to look out for obstacles on the ground and impacted an ant hill with the tail rotor. The helicopter tail rotor and empennage separated from the tail boom. Because of this, the helicopter lost control due to tail rotor effectiveness and the helicopter yawed to the left and impacted the ground on it skids.

2.3 The tail boom, the skids and the main rotor blades were substantially damaged. The tail rotor gear box and the empennage separated from the tail boom.

2.4 The maintenance records of the helicopter were checked and it was noted that the helicopter had been subjected to an MPI (Mandatory Periodic Inspection) on 16 October 2008. The inspection had been performed by an approved AMO (Aircraft Maintenance Organisation). The helicopter had flown a total of 8.6 hours since the last inspection had been certified by an approved person.

3. CONCLUSION:

3.1 Findings:

- 3.1.1 The pilot was the holder of a valid commercial helicopter pilot's licence and the helicopter type was endorsed in his logbook.
- 3.1.2 The pilot's medical certificate was valid until 30 June 2009.
- 3.1.3 The pilot and a new student were engaged in a training flight.
- 3.1.4 The pilot also held a Flight Instructor Rating Grade 2 and an instrument rating.
- 3.1.5 The helicopter had been maintained in accordance with the approved maintenance schedule, with the last MPI prior to the accident being certified on 16 October 2008.
- 3.1.6 The (AME) Aircraft Maintenance Engineer that certified the last inspection was accredited by the SACAA.
- 3.1.7 The helicopter was issued with the Certificate of Airworthiness and was valid until 26 July 2009.
- 3.1.8 The helicopter's right hand skid collapsed and the tail section separated from the helicopter due to the impact.
- 3.1.9 The helicopter was refuelled to full capacity prior to the flight.
- 3.9.10 The helicopter's weight and balance was within limits.
- 3.1.11 Fine weather conditions prevailed at the time of the accident and were not considered to have had any bearing on the accident.

3.2 Probable cause/s:

- 3.2.1 Tail rotor impacted an ant hill at low level flight.

3.3 Contributory cause/s:

- 3.3.1 Failure of the instructor and the student pilot to look out.

4. SAFETY RECOMMENDATIONS:

- 4.1 None.

5. APPENDICES:

- 5.1 There are no appendices to this report.

-END-

Report reviewed and amended by the Advisory Safety Panel
24 February 2009