

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9304	
Aircraft Registration	ZS-RHC	Date of Accident	27 March 2014		Time of Accident	1310Z
Type of Aircraft	R22 Beta		Type of Operation	Training		
Instructor Licence Type	Commercial Pilot – Helicopter		Age	26	Licence Valid	Yes
Instructor Flying Experience	Total Flying Hours		1 459,9		Hours on Type	393,5
Last point of departure	Wonderboom airport (FAWB) – Pretoria, Gauteng					
Next point of intended landing	Freeway airport (FAFW) – Private airfield, NE of Wonderboom airport					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Freeway airport (FAFW) – Private airfield, NE of Wonderboom airport (FAWB) at GPS position S25°28.6' E028°14.4' at an elevation of 3 800 ft.						
Meteorological Information	The instructor reported fine weather conditions with a light and variable wind, temperature of 26°C with 4/8 cloud at 2 000 ft AGL					
Number of people on board	2+0	No. of people injured	1	No. of people killed	0	
Synopsis	<p>The instructor pilot, accompanied by a pilot, departed from Wonderboom aerodrome to the Pretoria general flying area (#1).</p> <p>At Freeway airport (a private aerodrome within the Pretoria general flying area #1), the instructor commenced with a series of exercises in order to test the pilot for the renewal of his private pilot's licence (PPL).</p> <p>During a simulated forced landing, initiated at approximately 200 ft above ground level (AGL), the helicopter crashed because it had insufficient height to initiate a recovery.</p> <p>The helicopter sustained extensive damage to the airframe, skids, main rotor and tail rotor.</p> <p>The instructor escaped unharmed from the helicopter but the pilot sustained serious facial injuries and minor back injuries during the accident sequence.</p>					
Probable Cause						
The instructor initiated a simulated engine failure at a height which was insufficient to recover from the situation, therefore exhibiting poor judgement.						
Contributing factor(s)						
Insufficient speed and height.						
IARC Date				Release Date		



AIRCRAFT ACCIDENT REPORT

Name of Owner : Brits Pallets CC
Name of Operator : Vortx Aviation Training
Manufacturer : Robinson Helicopter Company
Model : R22 Beta
Nationality : South African
Registration Marks : ZS-RHC
Place : Freeway airport (FAFW)
Date : 27 March 2014
Time : 1310Z

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 produced without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 The instructor pilot, accompanied by a pilot, was executing confined landings in the general flying area (#1) of Pretoria, as part of the pilot's annual PPL test. Two of the landings were executed successfully.

1.1.2 Four simulated autorotation landings were also carried out successfully. After the last successful simulated autorotation they started gaining altitude and reached a speed of 40 to 50 kt at a height of approximately 200 ft AGL, when the instructor

initiated another simulated autorotation and decreased the power.

1.1.3 The pilots realised simultaneously that they were too low. While they tried to recover, the main rotor RPM dropped to 60% and there was insufficient time to increase the RPM of the engine and main rotor.

1.1.4 Within seconds, the helicopter crashed to the ground and rolled over.

1.1.5 The accident occurred during daytime at 1310Z at a GPS position of S25°28.6' E028°14.4' at an elevation of 3 800 ft.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The aircraft sustained extensive damage to the airframe, skids, main rotor and tail rotor.

1.3.2 The tail boom was severed by a combination of impact forces and a strike with the main rotor.

1.3.3 The skids failed as a result of the impact forces exerted on the helicopter during the touchdown.

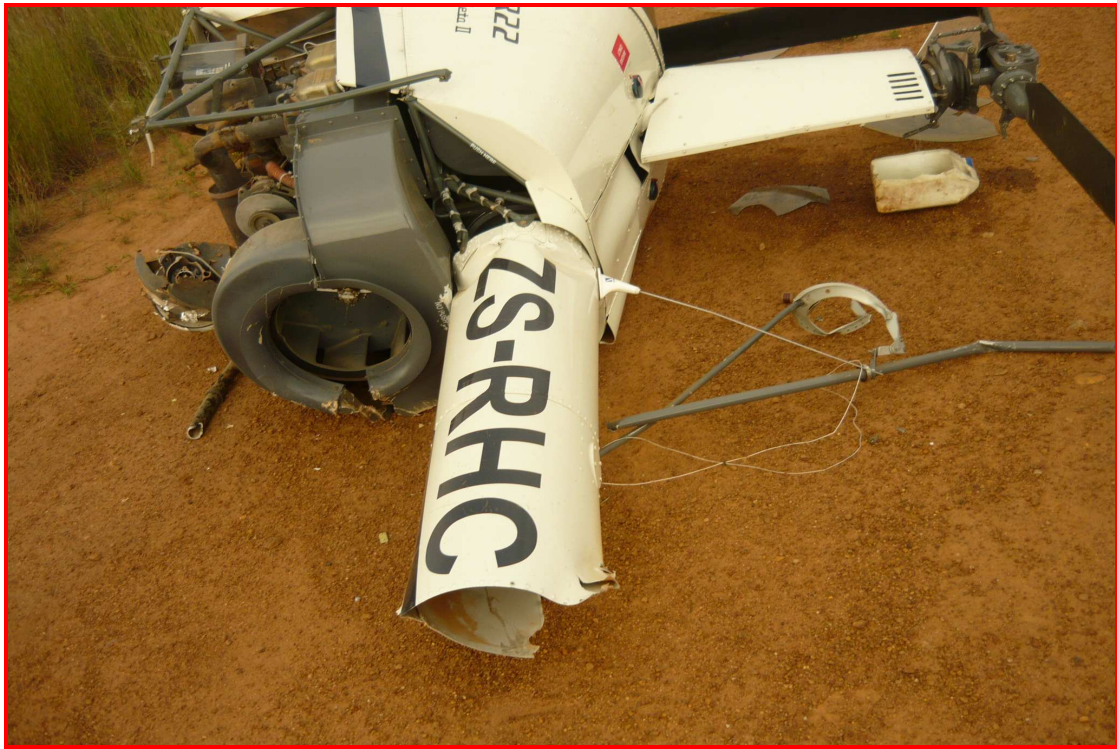


Figure 1: View of wreckage after accident

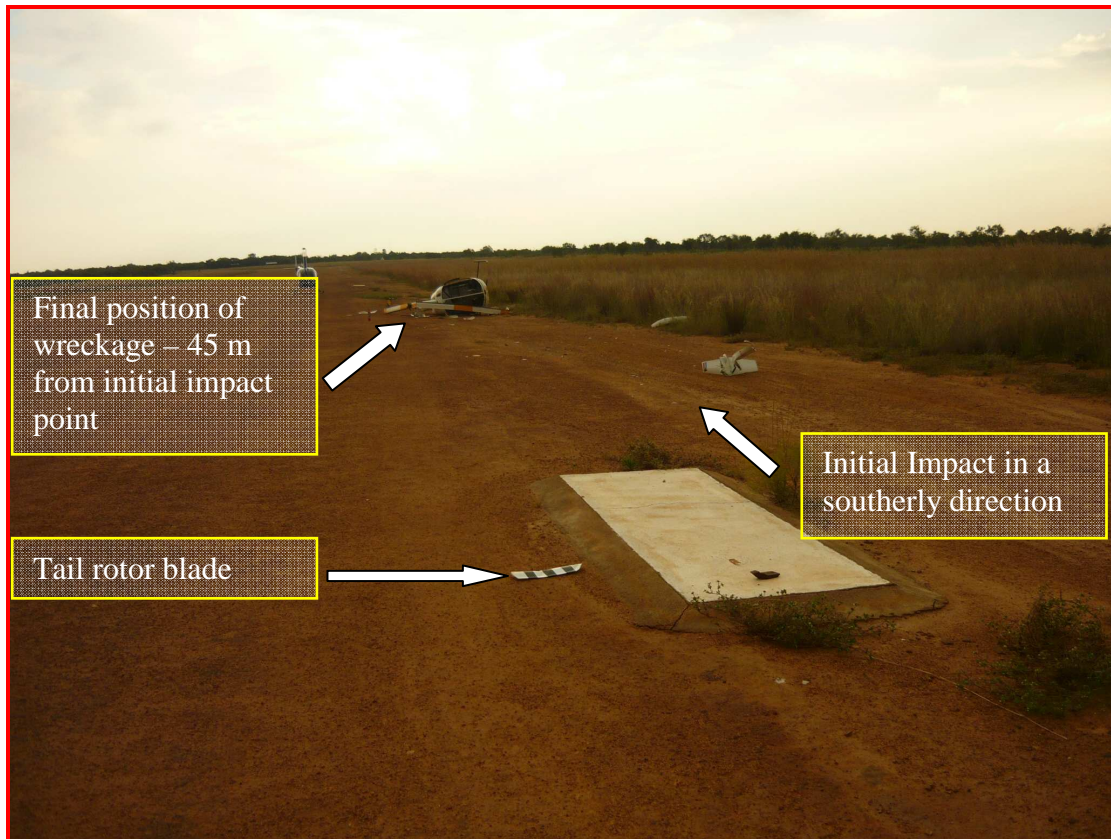


Figure 2: General view of accident site

1.4 Other Damage

1.4.1 There was no other damage.

1.5 Personnel Information

Instructor

Nationality	South African	Gender	Male	Age	26
Licence Number	0272316183	Licence Type	Commercial Pilot – Helicopter		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument: 2012-08-24–2014-08-31 Instructor Grade 2: 2012-10-20–2015-10-31 Test Pilot Class 2 Night Cull				
Medical Expiry Date	2014-11-30				
Restrictions	Nil				
Previous Accidents	Nil				

Flying Experience

Total Hours	1 459,9
Total Past 90 Days	7,3
Total on Type Past 90 Days	60,3
Total on Type	393,5

Pilot

Nationality	South African	Gender	Male	Age	40
Licence Number	0272444779	Licence Type	Private Pilot – Helicopter		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	No ratings				
Medical Expiry Date	2015-01-31				
Restrictions	Nil				
Previous Accidents	Nil				

Flying Experience

Total Hours	267 100 Aeroplane; 167 Helicopter
Total Past 90 Days	100 50 Aeroplane; 50 Helicopter
Total on Type Past 90 Days	46
Total on Type	130,1

1.6 Aircraft Information

Airframe

Type	R22 Beta	
Serial Number	2596	
Manufacturer	Robinson Helicopter Company	
Date of Manufacture	1996	
Total Airframe Hours (At time of Accident)	6 763,3	
Last MPI (Date & Hours)	23 August 2013	6 691,0
Hours since Last MPI	72,3	
C of A (Issue Date)	16 June 2013	
C of R (Issue Date) (Present owner)	27 May 2013	
Operating Categories	Standard Part 127	

Engine

Type	Lycoming O 360-J2A
Serial Number	L-34821-36A
Hours since New	6 763,3
Hours since Overhaul	1 277,4

1.7 Meteorological Information

According to the instructor, the following weather conditions prevailed at the time of the accident.

Wind direction	Variable	Wind speed	Light	Visibility	>10 km
Temperature	26 °C	Cloud cover	4/8	Cloud base	2000 ft AGL
Dew point	Unknown				

1.8 Aids to Navigation

1.8.1 The helicopter was equipped with standard navigational equipment as required by the manufacturer and the Regulator. No defects were reported prior to the accident.

1.9 Communications

1.9.1 The helicopter was equipped with standard communications equipment as required by the manufacturer and the Regulator. No defects were reported prior to the accident.

1.10 Aerodrome Information

Aerodrome Location	15 nm NNE of Pretoria	
Aerodrome Co-ordinates	S25°28.6' E028°14.4'	
Aerodrome Elevation	3 800 ft	
Runway Designations	02/20	
Runway Dimensions	1300 m x 45 m	
Runway Used	20	
Runway Surface	Gravel	
Approach Facilities	Nil	

1.11 Flight Recorders

1.11.1 The helicopter was not equipped with a cockpit voice recorder or a flight data recorder. Neither of the recorders is required by the relevant regulations to be fitted to the helicopter.

1.12 Wreckage and Impact Information

1.12.1 Freeway airport is a private airport located within the Pretoria general flying area (#1). The gravel runway is 1 300 m in length and 45 m wide and is surrounded by grass.

1.12.2 The helicopter hit the ground in a southerly direction and finally stopped approximately 45 m from the initial impact point.

1.12.3 According to the pilot, the forward speed was approximately 45 kt and the helicopter descended at a very high sink rate from about 200 ft AGL.

1.12.4 During the initial impact, a combination of the impact forces and a strike from the main rotor severed the tail boom.

1.12.5 The skids failed partially due to the high vertical impact forces. The helicopter bounced and finally came to rest on its right side, approximately 45 m from the initial impact point.

1.13 Medical and Pathological Information

1.13.1 Not applicable.

1.14 Fire

1.14.1 There was no evidence of any fire prior to or after the accident.

1.15 Survival Aspects

1.15.1 The instructor was seated in the right front seat and escaped unharmed from the wreckage. The pilot was seated in the left front seat and sustained serious facial injuries and minor back injuries during the accident sequence as a result of the high vertical impact forces exerted on the helicopter during the accident sequence.

1.15.2 None of the seats or the aircraft-equipped safety harnesses failed during the accident sequence and both occupants had used the harnesses.

1.16 Tests and Research

1.16.1 No further tests or research were performed following the accident.

1.17 Organizational and Management Information

1.17.1 The operator was in possession of a valid ATO certificate (# F07656), issued on 14 May 2013.

1.18 Additional Information

1.18.1 No additional information.

1.19 Useful or Effective Investigation Techniques

1.19.1 No special techniques used during the investigation.

2. ANALYSIS

2.1 Man:

The crew were correctly licensed to conduct the flight. Both crew members were rated on the aircraft type and both were in possession of valid medical certificates.

The instructor initiated a simulated autorotation and decreased the power at a height and speed which left insufficient time and height to recover from the situation.

2.2 Machine:

The aircraft was correctly maintained and operated within the weight limitations of the manufacturer.

There were no recorded defects on the helicopter prior to the accident.

2.3 Mission:

The purpose of the flight was to carry out an annual private pilot licence renewal test on the pilot. Four successful simulated autorotation landings were carried out. After the last autorotation, they started to climb to gain altitude and speed. However, with the speed at 40 to 50 knots and at a height of approximately 200 ft AGL, the instructor initiated another simulated autorotation and decreased the power. Immediately after this, both realised simultaneously that they were too low. In the process of trying to recover, the main rotor RPM dropped to 60% and there was insufficient time and height to increase the RPM of the engine and main rotor.

2.4 Weather:

The weather was not considered a contributing factor to this accident.

3. CONCLUSION

3.1 Findings

3.1.1 General

Both crew members were correctly licensed and qualified for the flight in accordance with existing regulations.

The maintenance records indicated that the aircraft was maintained in accordance with existing regulations and approved procedures.

The aircraft was operated within the weight limitations required by the manufacturer.

3.1.2 Purpose of flight:

The instructor, accompanied by a pilot, was executing confined landings in the general flying area (#1) of Pretoria, as part of the pilot's annual PPL test.

3.1.3 Weather:

The weather did not contribute to this accident.

3.2 Probable Cause/s

3.2.1 The instructor initiated a simulated engine failure at a height which was insufficient to recover from the situation, therefore exhibiting poor judgement.

3.3 Contributing factor(s)

3.3.1 Insufficient speed and height.

4. SAFETY RECOMMENDATIONS

4.1 In the interest of aviation safety it is recommended that the instructor should be re-evaluated by a designated examiner regarding his own skills in terms of autorotational landings.

5. APPENDICES

5.1 None.

Compiled by:

J.J. du Plessis

Date: 19 May 2014

For: Director of Investigations

Investigator-in-charge:

Date: 19 May 2014

Co-Investigator: None

Date: Not applicable