

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

					Reference:	CA18/2/3/8808	
Aircraft Registration	ZS-RXV	Date of Accident	22 July 2010		Time of Accident	0945Z	
Type of Aircraft	Robinson R22 Beta II		Type of Operation		Training		
Pilot-in-command Licence Type		Commercial	Age	27	Licence Valid	Yes	
Pilot-in-command Flying Experience		Total Flying Hours	560.9		Hours on Type	250.0	
Last Point of Departure		Rand Aerodrome (FAGM)					
Next Point of Intended Landing		Rand Aerodrome (FAGM)					
Location of the Accident Site with Reference to Easily Defined Geographical Points (GPS readings if possible)							
Approximately 300 m from south of the threshold of Runway 29 at GPS coordinates: S26°14.636' E028°09.415' , Elevation: 5466 AGL							
Meteorological Information		CAVOK weather conditions were reported at the time of the accident. Surface wind: 070/07 knots; Temperature: 16°C; Dew point: 08°C; QNH: 1032.					
Number of People on Board	1 + 1	No. of People Injured	1	No. of People Killed	0		
Synopsis		<p>The instructor and the student pilot were engaged in a training flight when the accident occurred. The student pilot was reported to be in control of the aircraft at the time of the accident. The instructor reported that he was demonstrating engine failures after take-off to the student. After completing the autorotation and recovery from autorotation, and while in the process of entering the aircraft into an 'in ground effect' hover approximately 1 ft above ground level, the student pilot experienced a sudden change in wind direction. As a result, the aircraft suddenly yawed to the left and the right-hand skid impacted and dug into the ground. The helicopter rolled over onto the right-hand side of the aircraft.</p>					
Probable Cause		<p>The student pilot lost control of the aircraft during low flying after experiencing a sudden change in wind direction that resulted in a yaw to the left and the right-hand skid impacting the ground.</p>					
Contributing factors:		<ul style="list-style-type: none"> Lack of supervision by the instructor 					
IARC Date		Release Date					



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Starlite Aviation (PTY) LTD
Manufacturer : Robinson Helicopter Company
Model : R22 BETA II
Nationality : South African
Registration Marks : ZS-RXV
Place : Rand Aerodrome (FAGM)
Date : 22 July 2010
Time : 0946Z

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 instructor and the student pilot were engaged on a training flight when the accident occurred. The student pilot was reported to be in control of the aircraft at the time of the accident.
- 1.1.2 The instructor reported that he was demonstrating autorotational landings after engine failures during take-off to the student. This was to demonstrate to the student how to flare the aircraft to cushion the landing after engine failure. After recovery from autorotation and while in the process of bringing the aircraft into an 'in ground effect' hover, approximately 1 ft above ground level, the wind direction suddenly changed.
- 1.1.3 According to the instructor, the flight path was 050°; with the sudden wind change it was 020°.
- 1.1.4 The aircraft suddenly yawed to the left and the right-hand skid impacted and dug into the ground. The aircraft rolled over onto the right-hand side of the aircraft.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The aircraft sustained substantial damage on the right-hand side of the fuselage, right-hand skid, main and tail rotor blades, tail boom and windshield.



Figure 1: Damage to the aircraft

1.4 Other Damage

1.4.1 There was no other damage.

1.5 Personnel Information

1.5.1 Instructor:

Nationality	South African	Gender	Male	Age	27
Licence Number	*****	Licence Type	Commercial		
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Instrument, Night, Flight instructor Grade II, Flight tests – single piston engine				
Medical Expiry Date	31 January 2011				
Restrictions	Corrective lenses				
Previous Accidents	None				

1.5.2 Instructor Flying Experience:

Total Hours	560.9
Total Past 90 Days	125.0
Total on Type Past 90 Days	47.0
Total on Type	250.0

Note: The student pilot was still under training, with 16.7 hours under instruction. The student pilot was in control at the time of the accident.

1.6 Aircraft Information

1.6.1 Airframe:

Type	R22 BETA II	
Serial No.	3954	
Manufacturer	Robinson Helicopter Company	
Date of Manufacture	2005	
Total Airframe Hours (At Time of Accident)	117.1	
Last MPI (Date & Hours)	7 July 2010	99.7
Hours Since Last MPI	17.4	
C of A (Issue Date)	13 April 2010	
C of R (Issue Date) (Present Owner)	28 August 2007	
Operating Categories	Training school	

1.6.2 Engine:

Type	Textron Lycoming
Model	O-360-J2A
Serial No.	L-40208-36A
Hours Since New	117.1
Hours Since Overhaul	TBO not reached

1.7 Meteorological Information

1.7.1 The following weather report was provided by the South African Weather Service:

Wind Direction	070°	Wind Speed	7 kt	Visibility	>10 km
Temperature	16°C	Cloud Cover	Nil	Cloud Base	Nil
Dew Point	03°C				

1.7.2 The instructor reported that an official weather forecast was not obtained prior to the flight. The following weather information was provided by Rand Aerodrome air traffic control (ATC), following a request by the investigator:

Wind Direction	020°	Wind Speed	7 kt	Visibility	9999
Temperature	15°C	Cloud Cover	NSC	Cloud Base	CAVOK
Dew Point	Not Known				

1.8 Aids to Navigation

1.8.1 The aircraft was equipped with standard navigation instrumentation as per manufacture design. None of the equipment was reported unserviceable during the flight or prior to the accident.

1.9 Communication

1.9.1 The aircraft was equipped with very high frequency (VHF) equipment and none of the VHF equipment was reported unserviceable during the flight or prior to the accident.

1.10 Aerodrome Information

1.10.1 The aerodrome information is as follows:

Aerodrome Location	Rand Aerodrome (FAGM)	
Aerodrome Co-ordinates	S26°1431'.1" E028°0904'.8"	
Aerodrome Elevation	5 483 ft	
Runway Designations	11/29	17/35
Runway Dimensions	1 660 m x 15 m	1 493 m x 15 m
Runway Used	35	
Runway Surface	Tar	
Approach Facilities	VOR, DME, NDB	

1.10.2 The accident occurred within the aerodrome parameter fence, approximately 300 m south of the threshold of runway 29. GPS coordinates: S26°14.636' E028°09.415' at elevation 5 466 ft above ground level (AGL).

1.11 Flight Recorders

1.11.1 The aircraft 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 aircraft.

1.12 Wreckage and Impact Information

1.12.1 The aircraft was reported to be approximately 1 ft above ground level when the wind direction changed suddenly. According to the instructor, the flight path was originally 050°, whereas after the sudden wind change it was to 020°.



Figure 2: The wreckage after it rolled over

1.12.2 The wind change resulted in a sudden yaw to the left during which the right skid impacted and dug into the ground. The helicopter rolled onto its right-hand.

1.12.3 The aircraft sustained damage on the right-hand side of the fuselage, right-hand skid, main and tail rotor blades, tail boom and wind shield.

1.13 Medical and Pathological Information

1.13.1 None.

1.14 Fire

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

1.15 Survival Aspects

1.15.1 Due to the limited structural damage to the cabin area and the fact that the aircraft was at a very low altitude when it rolled over onto its side, the accident was regarded as survivable. The occupants exited the wreckage unassisted.

1.16 Tests and Research

1.16.1 On-site inspection of the wreckage revealed that all structural damage was consistent with the impact forces. Nothing was found to suggest that there had been any pre-impact failure of the primary structure.

1.17 Organisational and Management Information

1.17.1 This was a training flight that was within the scope of accreditation and approval of the operator.

1.17.2 The aircraft training organisation (ATO) had a valid accreditation certificate at the time and date of the accident, which was issued on 29 June 2009 with an expiry date of 7 July 2010.

1.17.3 The last audit inspection at the ATO was conducted on 18 May 2009 and no corrective action requirement was identified during the audit.

1.17.4 The aircraft maintenance organisation (AMO) was in possession of a valid AMO certificate, which was issued on 1 April 2010 and which expires on 31 March 2011. The last audit at the AMO was performed on 30 March 2010. No major findings were recorded.

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 were engaged on a training flight when the accident occurred. The student pilot was reported to be in control of the aircraft at the time of the accident.

- 2.2 After completing the autorotation and while in the process of entering the aircraft into an 'in ground effect' hover, the wind direction suddenly changed; the aircraft was approximately 1 ft above the ground.
- 2.3 The aircraft suddenly yawed to the left and the right-hand skid impacted and dug into the ground. The aircraft rolled over onto its right-hand side, causing substantial damage to the aircraft.
- 2.4 It was concluded that the student's reaction was too slow to recover from the left yaw movement caused by the sudden wind change. Due to the low height above the ground, and the sudden change of wind, the instructor did not have sufficient time to take over control of the aircraft to correct the yaw.

3. CONCLUSION

3.1 Findings

- 3.1.1 The instructor was a holder of a valid commercial pilot's licence (helicopter).
- 3.1.2 The aircraft had a valid Certificate of Airworthiness and a valid Certificate of Registration.
- 3.1.3 Weather conditions were reported to be fine during the flight. However, a sudden change in wind direction was reported.
- 3.1.4 The accident occurred in daylight conditions.
- 3.1.5 The student pilot was still under training and was not yet in possession of a student pilot licence.
- 3.1.6 The student pilot was in control of the aircraft when the accident occurred. The instructor was too slow to take over control.
- 3.1.7 The helicopter experienced a sudden change in wind direction that resulted in a sudden yaw to the left. As a result of the yaw, the right-hand skid impacted the ground and the helicopter rolled onto its right-hand side.

3.2 Probable Cause/s

- 3.2.1 The student pilot lost control of the aircraft after experiencing a sudden change in wind direction, which resulted in yaw to the left and the right-hand skid impacting the ground.
- 3.2.2 Contributing factors:
 - Lack of supervision by the instructor

4. SAFETY RECOMMENDATIONS

- 4.1 None.

5. APPENDICES

5.1 None.

Report reviewed and amended by the Advisory Safety Panel 19 October 2010.

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