

<b>AIRCRAFT ACCIDENT SHORT REPORT</b>
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**CA18/2/3/9705: ZS-ROX, Decay in rotor revolutions per minute (RPM) during an out of ground effect hover turn after getting airborne from a confined area**

**Date and time** : 19 April 2018, 1400Z

**Occurrence type** : Accident

**Aircraft registration** : ZS-ROX

**Aircraft manufacturer and model** : Robinson Helicopter Company, R44 Raven II

**Last point of departure** : Blaawbank Farm

**Next point of intended landing** : Blaawbank Farm

**Location of accident site with reference to easily defined geographical points (GPS readings if possible)** : GPS coordinates: 25°30' 15.12" South, 027°47'14.67" East

**Meteorological Information** : Surface wind: Southerly at 3m/s (5.8kts), temperature: 22°C, cloud cover: overcast

**Type of operation** : Private (Part 91)

**Persons on board** : 1 + 3

**Injuries** : Nil

**Damage to aircraft** : Damage to the skid gear and lower fuselage

*All times given in this report are Coordinated 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 (2011) 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 blame or liability.***

**Disclaimer:**

*This report is produced without prejudice to the rights of the CAA, which are reserved.*

## 1. SYNOPSIS

- 1.1 The helicopter had completed a game capturing operation in the vicinity of Blaawbank Farm and was taking off from a confined area with four occupants on board with the intention to ferry the aircraft to a position 1nm south of Blaawbank Farm. The helicopter was facing north and the wind was coming from the south, so the helicopter entered a hover and made a right pedal turn towards the south to face the wind. As the helicopter left ground effect, approximately 3 meters above the trees, it experienced low rotor RPM. The pilot stated that he immediately landed the helicopter which impacted hard with the ground. The aircraft skids and lower fuselage were damaged in the accident. None of the occupants were injured.
- 1.2 Investigation revealed that the helicopter lost main rotor RPM during lift off resulting in a hard landing.

## 2. FACTUAL INFORMATION

- 2.1 On Thursday 19 April 2018, a Robinson R44 helicopter with registration marking ZS-ROX, had completed a game capturing operation and was set to take-off at 1400Z from Blaawbank Farm for a ferry flight to another private farm 1 nm south of its current position. The pilot was accompanied by three passengers.
- 2.2 At 1400Z, the helicopter was facing north and the wind was coming from the south so the pilot took off into a hover and made a right pedal turn towards the south to face the wind. As the helicopter left ground effect, approximately 3 meters above the trees, it experienced low rotor RPM. The pilot immediately landed and the helicopter impacted hard with the ground.
- 2.3 The helicopter sustained substantial damage during the hard landing. None of the occupants on board were injured.
- 2.4 The accident occurred during daylight conditions at a geographical position that was determined to be 25°30'15.12" South 027 47' 14.67" East at an elevation of 3 865ft above mean sea level (AMSL).



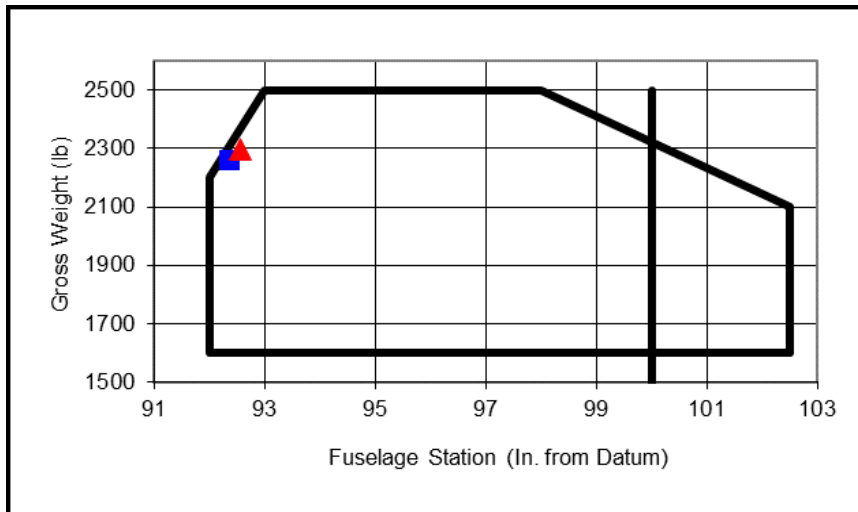
Figure 1: Helicopter landing site



Figure 2: Aircraft after the accident

### 3. ADDITIONAL INFORMATION

3.1 On the day of the accident, 25L of fuel was in the helicopter on take-off. The maximum take-off weight (MTOW) is 2 500 lbs and the helicopter weighed 2 298 lbs prior to take-off. The aircraft was being ferried to 1nm from its current position therefore 25L was adequate for it to reach its destination and the take-off weight was below its allowable maximum weight.



WEIGHT & BALANCE FOR AIRCRAFT	ZS-ROX	Category:	Ferry
<b>Robinson R44 Raven II</b>			
	<b>Arm</b>	<b>Weight</b>	<b>Moment</b>
<b>Item</b>	<b>in. from datum</b>	<b>lbs</b>	<b>lb-in.</b>
Basic empty weight as equipped	104.8	1 560.6	163 551
Pilot (R seat)	49.5	172	8 494
Forward passenger (L seat)	49.5	176	8 712
Forward baggage	44.0	0	0
Aft passengers and baggage	79.5	352	27 984
<b>Zero Usable Fuel</b>	<b>92.4</b>	<b>2 260</b>	<b>208 741</b>
Usable fuel at 6 lbs/gal (Main Tank)	106.0	25	2 686
Usable fuel at 6 lbs/gal (Auxiliary)	102.0	13	1 292
<b>MAUW</b>	<b>85.1</b>	<b>2 500</b>	<b>212 719</b>
<b>All Up Weight (take-off fuel)</b>	<b>92.6</b>	<b>2 298</b>	<b>212 719</b>
	<b>Balance (lbs)</b>	<b>202</b>	
<b>Fuel (gal)</b>	<b>To be used</b>	<b>Available</b>	<b>% Full</b>
Main Tank (6 lbs/gal)	4	30.6	14
Auxiliary Tank (6 lbs/gal)	2	18.3	11
<b>Weight conversion</b>	<b>kg</b>	<b>lbs</b>	
Pilot (R seat)	78	171.6	
Forward passenger (L seat)	80	176	
Forward baggage	0	0	
Aft passengers and baggage	160	352	

Figure 3: ZS-ROX weight and balance

#### **4. Investigation Revealed The Following:**

- 4.1 The pilot held a valid commercial pilot licence which had an expiry date of 28 February 2019 and his aviation medical certificate had an expiry date of 31 July 2018 with no medical restrictions. He had a total of 2076.2 flight time of which 2059.9 were on helicopters and 1105.0 were on the R44 type.
- 4.2 The pilot had a valid cull rating and the helicopter type was endorsed on his licence.
- 4.3 The last mandatory periodic inspection (MPI) on the helicopter was carried out on 26 February 2018 at 2796.7 airframe hours.
- 4.4 The aircraft maintenance engineer (AME) that carried out the MPI had the aircraft type endorsed on his licence.
- 4.5 The aircraft had a total of 2831.0 airframe hours at the time of the accident and had flown 34.3 hours since the last inspection.
- 4.6 The aircraft had a valid Certificate of Airworthiness and Certificate of Registration.
- 4.7 The pilot stated that the wind came from the south at approximately 3m/s (5.8 kts) and the temperature was 22°C.
- 4.8 The weight of the helicopter at take-off was 2 298lb which was below the MTOW of 2 500lb.
- 4.9 The helicopter impacted hard with the ground and broke both skids following an emergency landing due to an undetermined decay in rotor RPM.

#### **5. PROBABLE CAUSE/CONTRIBUTING FACTOR**

- 5.1 The helicopter lost main rotor RPM during lift off resulting on a hard landing

#### **6. REFERENCES USED IN THE REPORT**

- 6.1 R44 Pilot's Operating Handbook

**7. SAFETY RECOMMENDATION**

7.1 None.

**8. ORGANISATION**

8.1 None.