		<b>Ministry of Works and Transport</b>			<b>ACCID/102418/1-01</b>	
<b>DIRECTORATE OF AIRCRAFT ACCIDENT INVESTIGATION</b> <b>ACCIDENT REPORT – EXECUTIVE SUMMARY</b>						
<b>Aircraft Registration</b>	V5-HSF	<b>Date of Accident</b>	24 October 2018	<b>Time of Accident</b>	8:10 UTC	
<b>Type of Aircraft</b>	ROBINSON R44 HELICOPTER		<b>Type of Operation</b>	Private		
<b>Pilot-In-Command License Type</b>	PPL-HELICOPTER		<b>Age</b>	31	<b>License Valid</b>	Yes
<b>Pilot-In-Command Flying Experience</b>	Total Flying Hours		69.0	<b>Hours on Type</b>	69.0	
<b>Last point of departure</b>	Eros Airport (FYWE)					
<b>Next point of intended landing</b>	Farm Elisanor No. 85					
<b>Location of the accident site with reference to easily defined geographical points (GPS readings if possible)</b>						
During lift off at Eros Airport Northern Hangars helipad      S 22° 36' 45 "    E 017° 4' 73 "						
<b>Meteorological Information</b>	Wind: East N/E, Wind speed: 13-15 kts gusty, Visibility: CAVOK, Temperature 28°C, Cloud cover: None, Cloud base: None, Dew point: Not known.					
<b>Number of people on board</b>	2+0	<b>No. of people injured</b>	0	<b>No. of people killed</b>	0	
<b>Synopsis</b> <p>On the 24<sup>th</sup> of October 2018 at 08: 00 UTC, a Robinson R44 Helicopter with Registration Number V5-HSF took off from Eros Airport Northern Hangars helipad (FYWE) on a private flight to Farm Elisanor No. 85 in Otjondjupa Region for Rhinos counting operation. There were two pilots on board. The flight was planned under Visual Flight Rules (VFR) conditions that were prevailing at that time although no flight plan was filled. The flight originated from Mariental and landed at Eros Airport (FYWE) for refueling. Immediately after liftoff from a closed helipad at Eros Airport, the helicopter lost rotor RPM and run out of power. The pilot diverted to the north along the ditch as he was attempting to clear the fence. The helicopter's tail struck the ground which made the helicopter uncontrollable and was substantially damaged during ground impact.</p> <p>The Directorate of Aircraft Accident Investigation (DAAI) that carried out the investigation was informed telephonically about the accident on 24 October 2018 by one of the local operator. No accredited representative was appointed to participate in this investigation. The Minister of Works and Transport Ministry was responsible for the release of the official final accident report. There were no injuries to the two pilots. The helicopter was substantially damaged.</p> <p>The weather was fine with good visibility.</p> <p>The pilot was a holder of a Private Pilot License without Instrument and Night Flight Ratings. His medical certificate was valid with no restrictions. The aircraft type was also endorsed into his license.</p> <p>The last Mandatory Periodic Inspection (MPI) was certified on 06 August 2018 at 2898.9 airframe hours. At the time of the accident the aircraft had accumulated a further 67.7 hours since the last MPI was certified.</p> <p>According to the records, the Aircraft Maintenance Organization (AMO) that certified the last MPI on the aircraft prior to the accident was in possession of a valid AMO Approval No. 078 which was issued on 28 September 2018 and has an expiry date of 27 September 2019. There were no discrepancies identified when the Regulatory Authority conducted an audit on the AMO No. 078 at Eros Airport during the month of September 2018 and All Airworthiness Directives (AD) and Service Bulletins (SB) were complied with as certified in the last MPI dated 06 August 2018.</p>						
<b>Probable Cause</b>						
The helicopter tail rotor struck the ground shortly after liftoff.						
<b>Contributing Factors</b>						
Loss of rotor RPM after liftoff.						



# AIRCRAFT ACCIDENT REPORT

**Name of Owner** : H.B. Simon  
**Name of Operator** : H.B. Simon  
**Manufacturer** : Robinson Helicopter Company  
**Model** : 2009  
**Nationality** : Namibian  
**Registration Marks** : V5-HSF  
**Place** : During lift off at the Northern helipad at Eros Airport  
**Date** : 24 October 2018  
**Time** : 08:10 UTC

*All times given in this report are Co-ordinated Universal Time (UTC).*

## Disclaimer:

*This report is given without prejudice to the rights of the Directorate of Aircraft Accident Investigations, which are reserved.*

## Purpose of the Investigation :

*In terms of ICAO Annex 13, 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**.*

*This report contains fact relating to aircraft accidents or incidents which have been determined at the time of issue. The report may therefore be revised should new and substantive facts be made available to the investigator(s).*

## 1. FACTUAL INFORMATION

### 1.1 History of Flight

- 1.1.1 On the 24<sup>th</sup> October 2018 at around 08:10 UTC, a Helicopter, Robinson R44 Raven II type with registration V5-HSF crashed during lift off from Eros Airport Northern Hangars helipad which the Namibian Airport Company (NAC) reported that it has been closed for operation some years back. The flight originated from Mariental and stopped at Eros Airport for refueling before continuing to Farm Elisanor No. 85 in the Otjozondjupa Region where the helicopter was needed to carry out the Rhino counting operation. There were two pilots on board.
- 1.1.2 The co-pilot who has got only 69.0 total flying hours was occupying the right hand (R/H) seat and was the one on the control during liftoff. The co-pilot also did all the power check at Eros before liftoff and lost the rotor RPM. This resulted in the helicopter running out of power when the pilot tried to turn it out of the wind. The other pilot who was sitting on the left hand (L/H) seat and having a total of 5327.2 flying hours tried to help the pilot flying in recovering the helicopter with the dual controls from the L/H side seat but could not do so as the helicopter lost the rotor RPM. The wind which was from north east (NE) to south west (SW) during takeoff was reported to be strong.
- 1.1.3 Shortly after liftoff and while attempting to clear the fence, the pilot tried to turn the helicopter out of the wind. This resulted in him lost the rotor RPM and run out of power. The helicopter crash at a distance of approximately 250 meters from the helipad.

- 1.1.4 There were no flight plan filled indicating the route where this flight was heading to.
- 1.1.5 The investigation discovered that the pilot did not take into consideration the performance for the given weight, temperature and density altitude.
- 1.1.6 Comparing these figures with the performance graph of the Robinson R44 Raven II, it shows clearly that the helicopter was operated at the takeoff limit.

## 1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	2	-	-	-

## 1.3 Damage to Aircraft

- 1.3.1 The helicopter was substantially damaged due to the impact when its tail struck the ground.



**Figure 1.** The photo indicating the wreckage of V5-HSF where it came to a halt after the accident. The arrow pointed at the shattered windscreen.



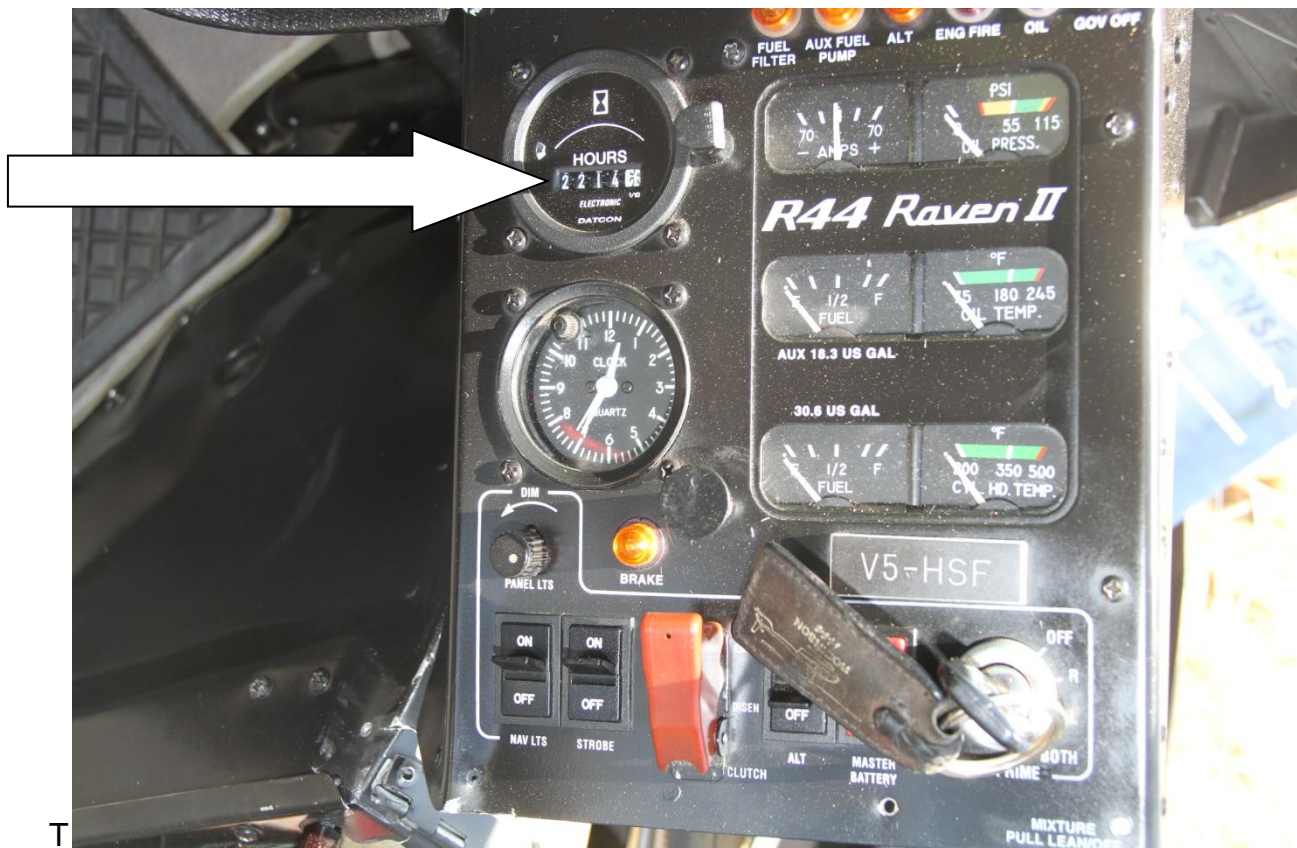


**Figure 2.** A photo showing the piece of the tail boom and the tail rotor.



**Figure 3.** Other pieces of the tail boom as well as the tail rotor.





**Figure 4.** A photo indicating some of the cockpit instruments indications. The arrow points at the Hobbs meter reading which reads 2214.3 Hobbs at the time of the accident.



**Figure 5.** The photo indicating the position of the Hydraulic switch on the right end of the cyclic. The arrow indicating that the Hydraulic switch was switched "ON" during the accident.



**Figure 6.** The photo indicating some other cockpit instrument indicators.

## 1.4 Other Damage

1.4.1 There was no other damage recorded.

## 1.5 Personnel Information

### 1.5.1 Pilot Flying

Nationality		Namibian			
Licence No	CA 50233	Gender	Male	Age	31
Licence valid		Yes	Type Endorsed	Yes	
Ratings		PPL – Helicopter			
Medical Expiry Date		31 October 2018			
Restrictions		None			
Previous Accidents		None			

Flying Experience :

Total Hours	69.0
Total Past 90 Days	0.0
Total on Type Past 90 Days	0.0
Total on Type	69.0

## 1.5.2 Pilot monitoring

Nationality		Namibian			
Licence No	CA 50233	Gender	Male	Age	56
Licence valid		Yes	Type Endorsed	Yes	
Ratings		PPL – Helicopter			
Medical Expiry Date		30 September 2019			
Restrictions		None			
Previous Accidents		None			

Flying Experience :

Total Hours	5327.2
Total Past 90 Days	95.7
Total on Type Past 90 Days	95.7
Total on Type	2678.8

## 1.6 Aircraft Information

**Airframe :**

Type	Robinson R44 Raven II	
Manufacturer	Robinson Helicopter Company	
Aircraft Serial Number	12843	
Year of Manufacture	2009	
Total Airframe Hours (At time of Accident)	2966.6 Hrs	
Last Annual Inspection (Date & Hours)	06 August 2018	2898.9 Hrs
Hours since Last Annual Inspection	67.7 Hrs	
C of A (Issue Date)	18 November 2011	
C of A (Expiry Date)	18 November 2018	
C of R (Issue Date) (Present owner)	18 November 2011	
Operating Categories	Standard: A,B,C,D,E,F	

**Engine:**

Type	Lycoming IO-540-AE1A5
Engine Serial Number	L-30322-48A
Hours since New	5186.7
Hours since Overhaul	787.5

**Propeller :**

Type	N/A
Propeller Serial Number	N/A
Hours since New	N/A
Hours since Overhaul	N/A

## WEIGHT AND BALANCE CALCULATION

The weight and balance availed by the pilot to the investigator indicated the helicopter's basic empty weight of 1548.9 lbs while the takeoff weight was 2498.9 lbs. The helicopter was having a total of 46.5 gallons of fuel on board when the accident happened. The weight of the two pilots plus 7 x10 lts jerry

cans, 6 x20 litres jerry cans of which three were filled with Avgas 100 LL fuel, the rifle, fuel pump and a bag containing the two pilots' clothes were calculated at 671.0 lbs. This indicated the total weight of 2266.4 lbs. The Weight and Balance calculation also indicated that the Takeoff Weight was 2498.9 lbs, while the Centre of Gravity (CG) at takeoff weight was 94.0 lbs. The Weight and Balance calculated by pilot using the GYRONIMO Performance Pad from the iPhone indicated that the weight and balance was within limit.

The field elevation at Eros Airport is 5574.0 feet above mean sea level (AMSL) and the temperature during Takeoff was 28°C. Based on the above calculation and putting into account the experience of the pilot, the airfield elevation above mean sea level, the density altitude which was 8265 at 28°C, fuel on board the helicopter, the temperature, the weight of the items carried on board plus the weight of the two pilots and the prevailing wind at that time, the investigation found out that it was impossible for the helicopter to take-off safely.

## **1.7 Meteorological Information**

1.7.1 The weather was reported to be fine with blue sky and strong wind. The visibility also was good at the time of the accident.

## **1.8 Aids to Navigation**

1.8.1 The aircraft was equipped with standard navigation equipment.

## **1.9 Communications.**

1.9.1 The pilot was communicating on frequency 118.9 at the time of the accident.

## **1.10 Aerodrome Information**

1.10.1 The accident happened when the helicopter lifted off from a closed helipad located at the northern hangars at Eros Airport and not on the runway or taxiway. Neither did it took place on the apron.

## **1.11 Flight Recorders**

1.11.1 The aircraft was not equipped with Flight Data Recorders (FRD) or Cockpit Voice Recorder (CVR) nor does it required by the regulation.

## **1.12 Wreckage and Impact Information**

1.12.1 The helicopter suffered substantially damages when it impacted the ground. The windscreen was shattered due to impact forces. All the landing skids were found broken off and the whole tail section separated from the main wreckage.





**Figure 7.** Another view of V5-HSF wreckage after the accident at Eros Airport's northern hangars.



**Figure 8.** A blue bag containing the fuel pump. Some of the 13 jelly cans that were carried onboard behind the rear seats were also visible in the photo.



**Figure 9.** A photo indicating the closed helipad at Eros Airport Northern Hangars with some helicopters still parked on it.

### **1.13 Medical and Pathological Information**

1.13.1 The pilot was a holder of a Private Pilot Licence- Helicopter without Instrument and Night Flight Ratings. His Medical Certificate was valid and the aircraft type endorsed into his license at the time of the accident.

### **1.14 Fire**

1.14.1 There was no pre- or post impact fire during the accident.

### **1.15 Survival Aspects**

1.15.1 Both two pilots survived the accident due to the fact that the impact forces involved during the accident were not beyond human body tolerance and there was no compression of the cabin. The pilots were also properly restraint.

### **1.16 Tests and Research.**

1.16.1 None was conducted.

### **1.17 Organizational and Management Information**

1.17.1 This was a private operation.

1.17.2 The Helicopter is owned and operated by Mr. Heinrich Bernard Simon.

1.17.3 Both Certificates (C of A and C of R) were valid at the time of accident.

- 1.17.4 The last Mandatory Periodic Inspection (MPI) was carried out by Trio Aviation Namibia at Eros Airport which was in possession of a valid AMO Approval No: 078 with an expiry date 27 September 2019.

## **1.18 Additional Information**

- 1.18.1 During the investigation, it was found that there were 7 x 10 litres empty jelly cans, 6 x 20 litres jelly cans of which three (3) were filled with Avgas 100LL, a bag containing the fuel pump, a rifle as well as a bag containing the pilot's personal clothes. All the above mentioned items were carried in the cockpit at the back of the rear seat.
- 1.18.2 The fuel receipt from Puma Energy (Pty) Ltd at Eros Airport indicated that the fuel delivered (uplifted) were 181 litres of which 60 litres were filled in 3 x 20 litres jelly cans which was found carried on board.
- 1.18.3 The Weight and Balance calculation which was calculated using the GYRONIMO Performance Pad from the iPhone indicating that the weight was within the prescribed limit.
- 1.18.4 The Hydraulic Switch on the right hand side of the pilot's cyclic control grip which is used to energizes the solenoid that opens a valve on the reservoir and pressurizes the system, was found switched "ON" at the time of the accident.
- 1.18.5 The Hydraulic pump (whether switched "ON" or "OFF") does not have any effect to the helicopter performance. Since electrical power is only required to switch the system off, the electrical system failure does not affect hydraulic operation. (See Robinson Maintenance Manual Chapter 8.004, Page 8.1A for reference).
- 1.18.6 Based on the flying experience and the total number of flying hours the pilot flying the helicopter was having, the investigation found it difficult for such a pilot to operate or liftoff a full loaded helicopter especially when the wind is strong.

## **1.19 Useful or Effective Investigation Techniques**

- 1.19.1 None was used.

## **2. ANALYSIS**

- 2.1 The flight originated from Mariental where the operator's base of operation is located.
- 2.2 The accident happened during the liftoff of the helicopter from Eros Airport's northern hangars helipad.
- 2.3 It was the view of the investigation that the flying experience plus the low flying hours of the pilot on the helicopter made it difficult for him to operate and liftoff a full loaded helicopter from the northern hangars helipad especially when the wind is strong.
- 2.4 The investigation found 7 x10 liters empty jerry cans, 6 x20 liters jerry cans of which 3 were filled with an amount of 60 liters of AFGAS 100LL fuel, a blue bag containing the fuel pump, a rifle and a bag containing the two pilots' clothes.
- 2.5 The fuel receipt from Puma Energy (Pty) Ltd at Eros Airport indicated that the fuel uplifted at Eros Airport was 181 litres of which 60 litres were filled in the 3 x20 litres jelly cans which were part of the items found loaded behind the helicopter's back seat.
- 2.6 Although Namibia Airport Company (NAC) reported that the helipad at Eros Airport's northern hangars has been closed for some years back, there are still no measure in place to restrict the helicopter operators not to land and take off from that helipad.



- 2.7 Although the Weight and Balance calculation indicated that the weight was within the prescribed limit, the investigation discovered that the pilot did not take into consideration the density altitude, the temperature, the weight of the items carried on board as well as the prevailing wind during the take-off time.
- 2.8 When comparing the indicated figures with the performance graph of the Robinson R44 Raven II, it shows that during the calculation of the performance graph that the density altitude at the time of the accident was too high for the helicopter to liftoff successfully as it was operated at the take-off limit.
- 2.9 There is a hydraulic switch on the right hand (R/H) side of the pilot's cyclic control grip which is used to energize the solenoid that opens a valve on the reservoir and pressurizes the system. In normal operation this switch is always switched "ON", the position in which it was found when the helicopter crashed.
- 2.10 The information on the pilot questionnaire indicated that there was no flight plan filled for this flight.

### **3. CONCLUSION**

#### **3.1 Findings**

- 3.1.1 The pilots' licences were valid at the time of the accident.
- 3.1.2 The pilots' medical certificates were all valid.
- 3.1.3 The Helicopter's Certificate of Airworthiness (C of A) and Certificate of Registration (C of R) were valid during the accident.
- 3.1.4 The flying experience the low flying hours of the pilot on the helicopter type plus the wind which was strong at that time, made it difficult for him to operate and liftoff a full loaded helicopter from the northern hangars helipad.
- 3.1.5 The pilot lost the rotor RPM immediately after take-off while trying to turn the helicopter out of the wind during takeoff.
- 3.1.6 The pilot who was occupying the left hand (L/H) seat tried to help recover the helicopter with the dual control but could not recover the rotor RPM.
- 3.1.7 The weight and Balance calculation which was done using the using the GYRONIMO Performance Pad from an iPhone indicated that the weight was within the prescribed limit.
- 3.1.8 The pilot did not take into consideration the performance for the given weight, temperature and density altitude during the day and time of the accident.
- 3.1.9 The investigation revealed that the helicopter was operated at a takeoff limit.
- 3.1.10 The investigation discovered a total of 7 x 10 litres empty jerry cans, 6 x 20 litres jerry cans of which 3 of them were filled with AVGAS 100LL fuel, a blue bag containing the fuel pump as well as a rifle and a bag containing the pilots' personal clothes which were found loaded inside the cabin at the back of the rear seat.
- 3.1.11 The Hydraulic switch located on the right hand (R/H) side of the pilot's cyclic control grip which is used to energizes the solenoid that opens a valve of the Hydraulic pump was found switched "ON" during the investigation of the accident.
- 3.1.12 The pilot did not take into consideration the performance for the given weight, temperature and density altitude.

3.1.13 The investigation discovered that the helicopter was operated at the takeoff limit when compared to the figures in the performance graph of the Robinson Helicopter, Raven II.

### 3.2 Probable Cause/s

3.2.1 The helicopter tail rotor stuck the ground shortly after liftoff.

### 3.3 Contributing factors

3.3.1 Fail to maintain rotor RPM after liftoff.

## 4. SAFETY RECOMMENDATIONS

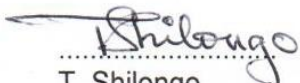
### 4.1 Namibia Airport Company (NAC) 04/01/2019

Namibia Airport Company need to take appropriate measures when it comes to the usage of the helipad at Eros Airport's northern hangars which they stated that it has been closed for several years, but still allow helicopters to land, refuel and take-off from it.

### 4.2 Regulatory Authority (NCAA) 05/01/2019

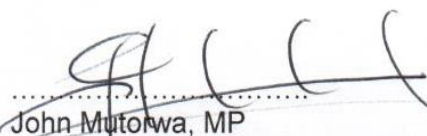
The investigation also recommended that NCAA should take appropriate action to make sure that NAC put up strictly measures in place when it comes to the use of the northern hangar helipad not to allow helicopter pilots to make use of it anymore.

Compiled by:

  
T. Shilongo  
Investigator-in-charge

Date: 18/12/2019

Released by:

  
John Mutorwa, MP  
MINISTER: MINISTRY OF WORKS AND TRANSPORT

Date: 29/1/2020

