

<b>AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY</b>
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				Reference:	CA18/2/3/9454	
<b>Aircraft registration</b>	ZS-HXP	<b>Date of accident</b>	2 July 2015		<b>Time of accident</b>	1230Z
<b>Type of aircraft</b>	Robinson R22		<b>Type of operation</b>		Game capture (Part 137)	
<b>Pilot-in-command licence type</b>	Commercial		<b>Age</b>	30	<b>Licence valid</b>	Yes
<b>Pilot-in-command flying experience</b>	Total flying hours		3050.0		Hours on type	99.0
<b>Last point of departure</b>	Private farm Oufontein, Victoria West Area, Northern Cape					
<b>Next point of intended landing</b>	Private farm Oufontein, Victoria West Area, Northern Cape					
<b>Location of the accident site with reference to easily defined geographical points (GPS readings if possible)</b>						
Farm Oufontein, Victoria West district (GPS position: 31°14.762 Souh 023°45.556, elevation 4073ft AMSL)						
<b>Meteorological information</b>	Surface wind: 270°/3 knots; Temperature 17°C; Visibility: 8000 m					
<b>Number of people on board</b>	1 + 1	<b>No. of people injured</b>	0	<b>No. of people killed</b>	1	
<b>Synopsis</b>	<p>On 2 July 2015, the pilot, accompanied by a net-gun operator, took off from the private farm Oufontein in the Victoria West area, Northern Cape, at approximately 11:30Z and flew in a north-westerly direction where they captured several antelope (springbok) on the farm.</p> <p>However, during the last animal-capturing operation on the farm, the pilot manoeuvred the helicopter approximately 15 metres overhead the antelope for the net-gun operator to trigger the net gun and to capture the animal in the net on the ground</p> <p>The pilot concluded that as the net-gun operator triggered the net weights out of the net gun, one of the three weights fitted to the net became stuck inside the gun barrel, causing the net to swing right into the tail rotor. With the interference of the tail rotor, the helicopter started spinning out of control. The pilot immediately retarded the engine power to idle just before the helicopter impacted the ground. During the impact sequence, the main rotor blades struck and severed the tail boom from the helicopter. The net-gun operator was seriously injured when one of the main rotor blades struck his head, which rendered him unconscious. He succumbed to his injuries in hospital four days later.</p>					
<b>Probable cause</b>						
<p>One of the four net weights became stuck in the barrel of the net gun when it was fired, which caused the net to swing into the tail rotor. The pilot lost control of the helicopter when it started spinning in a clockwise direction and impacted the ground.</p>						
SRP date	March 2017		Release date	27 June 2017		



## AIRCRAFT ACCIDENT REPORT

**Name of Owner** : Mossel Bay Helicopters  
**Name of Operator** : Kukamata Game Capture  
**Manufacturer** : Robinson Helicopter Company  
**Model** : R22 Beta  
**Nationality** : South African  
**Registration Marks** : ZS-HXP  
**Place** : Farm Oufontein, Victoria West, Northern Cape  
**Date** : 02 July 2015  
**Time** : 1230Z

*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 (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 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 On 2 July 2015, the pilot, accompanied by a net-gun operator, took off from the private farm Oufontein in the Victoria West area, Northern Cape, at approximately 11:30Z and flew in a north-westerly direction where they captured several antelope (springbok) on the farm.
- 1.1.2 However, during the last animal-capturing operation on the farm, the pilot manoeuvred the helicopter approximately 15 metres overhead the antelope for the net-gun operator to trigger the net gun and to discharge the net over the animal on the ground below the helicopter.
- 1.1.3 The pilot concluded that as the net-gun operator fired the net weights out of the net gun, one of the four weights fitted to the net became stuck inside the gun barrel,

causing the net to swing right into the tail rotor. The helicopter then started spinning out of control and the pilot immediately selected the engine to idle just before the helicopter impacted the ground. .

- 1.1.4 During the impact sequence, the main rotor blades struck and severed the tail boom from the helicopter. One of the main rotor blades also impacted the cockpit area, causing serious injuries to the net-gun operator, which rendered him unconscious. He succumbed to his injuries in hospital four days later.

## 1.2 Injuries to Persons

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

## 1.3 Damage to Aircraft

- 1.3.1 The helicopter was substantially damaged during the impact sequence.



Figure 1: The main wreckage

## 1.4 Other Damage

- 1.4.1 There was no other damage.

## 1.5 Personnel Information

### 1.5.1 Pilot-in-Command (PIC):

Nationality	South African	Gender	Male	Age	30
Licence number	0271060170	Licence type	Commercial Pilot		
Licence valid	Yes	Type endorsed	Yes		
Ratings	Night, Undersling / Winch, Game / Livestock Culling				
Medical expiry date	31 October 2015				
Restrictions	Nil				
Previous accidents	Nil				

### 1.5.2 Flying experience:

Total hours	3050.0
Total past 90 days	105.0
Total on type past 90 days	70.0
Total on type	99.0

## 1.6 Aircraft Information

1.6.1 The Robinson R22 is a two-bladed, single-engine light-utility helicopter manufactured by Robinson Helicopters. Due to the relatively low acquisition and operating costs, the R22 has been popular as a rotorcraft trainer. The basic structure of the R22 Beta is welded chromoly steel tubing. The forward fuselage is made of fibreglass and aluminium with a Plexiglas canopy. The tail cone, vertical and horizontal stabilisers are made of aluminium. The helicopter was equipped with a horizontal-mounted four-cylinder air-cooled Lycoming O-320-J2A, normally aspirated carburettor engine.

### Airframe

Type	Robinson R22 Beta
Serial number	1520
Manufacturer	Robinson Helicopter Company
Year of manufacture	1990

Total airframe hours (at time of accident)	4266.6	
Last MPI (hours & date)	4178.5	16 July 2014
Hours since last MPI	88.1	
C of A (Issue date)	10 March 2016	
C of R (Issue date) (present owner)	09 September 2011	

### Engine:

Type	Lycoming O-320-J2A
Serial number	L-16323-39A
Hours since new	1469.1
Hours since overhaul	Hours not yet reached

## 1.7 Meteorological Information

1.7.1 An official weather report was obtained from the South African Weather Services (SAWS) for the date and time of the accident.

i Satellite image:

No clouds were observed at the accident site at the estimated time of the occurrence. The satellite image showed clear sky conditions over the accident site.

ii Vertical wind and temperature profile from the Tephigram:

A Tephigram recorded at De Aar (FADY) showed the vertical profile of the winds and temperature. This information can be used to determine the most likely wind and temperatures at the accident site. Together with the surface observational data, a north-westerly wind of approximately 10 knots could be deciphered at the accident area at low levels.

iii Surface observations

No meteorological observational data is available. As a result, meteorological aerodrome reports, METARs and SYNOP data from surrounding weather stations are included to provide general surface weather conditions over the area. De Aar (FADY) and Fraserburg are included in order to provide general surface conditions over the accident area. The surface wind recorded did not exceed 10 knots, with moderate turbulence conditions at low levels.

## Station FADY

Date: 2015-01-17

METAR: FADY 021200Z 31006KT CAVOK 19/M00 Q1026=

METAR: FADY 021300Z 29008KT CAVOK 19/M00 Q 1026=

## Synoptic data from Fraserburg:

201507021200 AAXX 02124 68624 32982 03603 10188 21026 38805 48566  
57017 333 10188 21003 91007 555 91024=

- 1.7.3 The following weather information was obtained from another pilot whilst flying in the area during the approximate time of the accident.

Wind direction	N/W	Wind speed	5 km/h	Visibility	10 000m
Temperature	17° C	Cloud cover	None	Cloud base	None
Dew point	Unknown				

## 1.8 Aids to Navigation

- 1.8.1 The helicopter was equipped with the approved navigational aids. No defects of the navigational equipment were experienced prior to or at the time of the accident.

## 1.9 Communications

- 1.9.1 The helicopter was equipped with the approved communication equipment. No defects were experienced prior to or at the time of the accident.

## 1.10 Aerodrome Information

- 1.10.1 The aircraft accident occurred on an open grass-covered field on a private farm, Oufontein, in the Victoria West district, Northern Cape. The geographical position of the accident site was 31°14.762 South 023° 45.556 East at 4 073 feet AMSL.

## 1.11 Flight Recorders

- 1.11.1 The aircraft was not equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR), nor were these required by the regulations to be fitted to this type of aircraft.

## 1.12 Wreckage and Impact Information

1.12.1 During the impact sequence, the main rotor blades impacted and subsequently severed the tail boom and tail rotor from the fuselage. One of the main rotor blades also impacted the cabin area, causing extensive damage to the helicopter.

**Figure 2:** The main wreckage as it came to rest



**Figure 3:** The tail rotor gearbox, hub and two severed stubs tail rotor blades

1.12.2 The tail rotor was located 20 metres from the main wreckage at the accident site.

## 1.13 Medical and Pathological Information

1.13.1 The pilot sustained no injuries during the accident.

1.13.2 The net-gun operator was seriously injured and succumbed to his head injuries four days later in hospital.

## 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 accident was considered survivable due to the low magnitude deceleration forces when the helicopter impacted the ground surface.
- 1.15.2 The occupants on board the helicopter were properly secured by the safety harnesses.
- 1.15.3 The net-gun operator was seriously injured and rendered unconscious when one of the main rotor blades impacted the cabin area and struck his head. He succumbed to his injuries in hospital four days later.

## 1.16 Tests and Research

### 1.16.1 Net gun information:

The hand-held net gun is known as a New Zealand invention. The net gun was initially hand held and later mounted in the helicopter. Aiming the net gun by the net gun operator requires excellent flying skills and sometimes dangerous manoeuvres by the pilot, especially when it gets difficult for the pilot to get close to the animals being netted. Net guns are not listed and do not require drug licences although some animals are sometimes sedated after being captured and transported.

Ref: <http://www.teara.govt.nz/en/photograph/15804/live-capture-by-net-gun>



**Figure 4:** The net-gun displayed with the four barrels where the weights are fired from

## 1.17 Organisational and management information

- 1.17.1 The last maintenance that was carried out on the helicopter prior to the accident



was performed by the Aircraft Maintenance Organisation (AMO) who was in possession of a valid AMO Approval Certificate to perform the require maintenance on the helicopter.

## **1.18 Additional Information**

1.18.1 None

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

1.19.1 No new methods were applied.

## **2. ANALYSIS**

2.1 The pilot and the net-gun operator were capturing game on a private farm in the Victoria West area in the Northern Cape. The pilot and the net gun operator netted and captured several animals (springbok) on the private farm on the day that the accident occurred.

2.2 During the last game capturing operation, the net-gun operator triggered the net gun in order to release the four weights inside the four barrels of the gun. However, one of the four weights that was attached to the net being used to capture the animals below became stuck inside the barrel of the net-gun, causing the net to swing back into the tail rotor. The helicopter then started to spin out of control and impacted the ground.

2.3 The pilot sustained no injuries during the accident, but the net-gun operator sustained serious head injuries during the impact sequence, which rendered him unconscious. The net-gun operator succumbed to his injuries in hospital four days later.

## **3. CONCLUSION**

### **3.1 Findings**

3.1.1 The pilot was the holder of a valid commercial helicopter pilot's licence and had the helicopter type endorsed on his licence. He had accumulated a total of 809.9 flying hours, which included 326.8 hours on the type helicopter.

- 3.1.2 The pilot was also the holder of a valid aviation medical certificate issued by an approved medical examiner.
- 3.1.3 The helicopter Certificate of Airworthiness was valid at the time of the accident.
- 3.1.4 The pilot and net-gun operator were carrying out net-gun game capturing events when the accident occurred. As the net-gun operator triggered the net gun to capture a springbok below the helicopter, one of the four weights attached to the net became stuck inside the barrel of the gun, causing the net to swing back into the tail rotor. With the loss of the tail rotor effect, the helicopter started spinning around and impacted the ground.
- 3.1.5 Fine weather conditions that prevailed at the time of the accident were not considered to have had any bearing on the accident.

### **3.2 Probable Cause**

- 3.2.1 One of the four net weights became stuck in the barrel of the net gun when it was fired, which caused the net to swing into the tail rotor. The pilot lost control of the helicopter when it started spinning in a clockwise direction and impacted the ground.

## **4. SAFETY RECOMMENDATIONS**

- 4.1 The Safety message to the operator operating aircraft fitted with net-gun machine must ensure that all equipment (net-gun machine) to be carried in their aircraft and used by any person (net-gun operator) in their operations is serviceable and adequate training is provided for the use of the net-gun machine.

## **5. APPENDICES**

- 5.1 None