SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Occurrence Investigation**

Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8697		
Aircraft Registration	**ZS-RYT**	**Date of Accident**	09 October 2009		**Time of Accident**	1730Z	
Type of Aircraft	Robinson R44 II		**Type of Operation**		Private		
Pilot-in-command Licence Type	Private Pilot Licence		**Age**	42	**Licence Valid**	No	
Pilot-in-command Flying Experience	Total Flying Hours		450.8		Hours on Type	Unknown	
Last point of departure	Ermelo Airfield (FAEO, Mpumalanga province)						
Next point of intended landing	Ermelo Airfield (FAEO, Mpumalanga province)						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
Pampoenkraal Farm (S26º 46' 51.81" E030º 23' 23.86")							
Meteorological Information	Surface wind: 170 at 08 knots; Temperature: 17ºC,Thunderstorms and Rain						
Number of people on board	1 + 1	**No. of people injured**	0	**No. of people killed**	2		

Synopsis

The pilot, accompanied by a passenger took off from Ermelo to Springbokfontein Farm in Mpumalanga. When the helicopter reached overhead the destination, the pilot realised that he could not land due to low cloud and poor visibility, and called his wife to inform her that they would be returning to Ermelo.

At about 1730Z, the passenger called his own wife, requesting her to meet him and the pilot in Ermelo as they would be requiring transportation back to the farm. When the helicopter failed to arrive in Ermelo, the police were informed and therefore search andrescue was initiated.

The aircraft was found the following morning by an employee at an adjoining farm. It had crashed at Pampoenkraal Farm onto a freshly harvested maize field.

Both occupants had been fatally injured and the aircraft was destroyed.

Probable Cause

Loss of aircraft control due to lack outside visual reference (spatial disorientation).

IARC Date		Release Date	

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Occurrence Investigation**
Telephone number: **011-545-1000**
E-mail address of originator: **thwalag@caa.co.za**

Form Number: CA 12-12a

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Panbult Denne Saagmeule (Pty) Ltd
Manufacturer : Robinson Helicopter Company
Model : Robinson R44 II
Nationality : South African
Registration Marks : ZS-RYT
Place :Pampoenkraal Farm S26°46' 51.81" E030°23' 23.86"
Date :9 October 2009
Time : 1730 Z

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

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1. The pilot, accompanied by a passenger took off from Ermelo to Springbokfontein Farm in Mpumalanga. When the helicopter reached overhead the destination, the pilot realised that he could not land due to low cloud and poor visibility, and called his wife on his cellphone to inform her that they would be returning to Ermelo.

1.1.2. At about 1730Z, the passenger called his own wife, requesting her to meet him and the pilot in Ermelo as they would be requiring transportation back to the farm. When the helicopter failed to arrive in Ermelo, the police were informed and therefore searchandrescue was initiated.

1.1.3. The aircraft was found the following morning by an employee at an adjoining farm. It had crashed at Pampoenkraal Farm onto a freshly harvested maize field.

1.1.4. Both occupants had been fatally injured and the aircraft was destroyed.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The aircraft was destroyed in the accident.

1.4 Other Damage

1.4.1 There was no other damage.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	42
Licence Number	0270430531	Licence Type	Private Pilot		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	31 August 2010				
Restrictions	1) Must wear hearing protection 2) Not permitted to fly aircraft fitted with EFIS 3) Daylight visual flight rules (VFR) flying conditions only				
Previous Accidents	On 23 April 2005, the pilot experienced tail rotor failure on a Robinson R44, due to an animal running into the rotor.				

Flying Experience

Total Hours	450.8
Total Past 90 Days	4.6
Total on Type Past 90 Days	4.6
Total on Type	Unknown

Note: The pilot's flying logbook was not found and therefore the exact flying hours at the time of accident could not be determined. The flying experience was obtained from the SACAA pilot's file where it was recorded when he applied for a licence revalidation on 18 November 2008,

1.6 Aircraft Information

1.6.1 The helicopter was manufactured in the USA, imported new into South Africa in November 2005 and entered onto the South African register on 5 December 2005.

1.6.2 It had not been registered in the USA**.**

1.6.3 The certificate of airworthiness was issued on 8 December 2005.

Airframe:

Type	Robinson R44II	
Serial Number	10975	
Manufacturer	Robinson	
Date of Manufacture	2005	
Total Airframe Hours (At time of Accident)	518.6	
Last Annual Inspection (Date & Hours)	4 August 2009	500.1
Hours since Last MPI	18.5	
C of A (Issue Date)	8 December 2005	
C of R (Issue Date) (Present owner)	27 February 2006	
Operating Categories	Standard	

Engines:

Type	Textron Lycoming IO-540-AE1A5
Serial Number	L30617- 48A
Hours since New	500.1
Hours since Overhaul	TBO not reached

1.7 Meteorological Information

The following official weather report was supplied by the South African Weather Service:

Wind direction	170°	Wind speed	8 knots	Visibility	9999
Temperature	17℃	Cloud cover	BKN 025, FEW035C	Cloud base	2 500 Feet
Dew point	9℃				

The forecast above was for Ermelo(FAEO) and there are no facilities to collect weather information at the accident site.

1.7.1 The satellite image at 17:30Z dated 09 October 2009

The satellite image below shows a band of thunderstorm activities stretching from central Botswana, to Pilanesburg area, northern Gauteng, towards Witbank and Ermelo area and exiting the country around Maputo. This band of thunderstorm falls over the area of the aircraft accident.

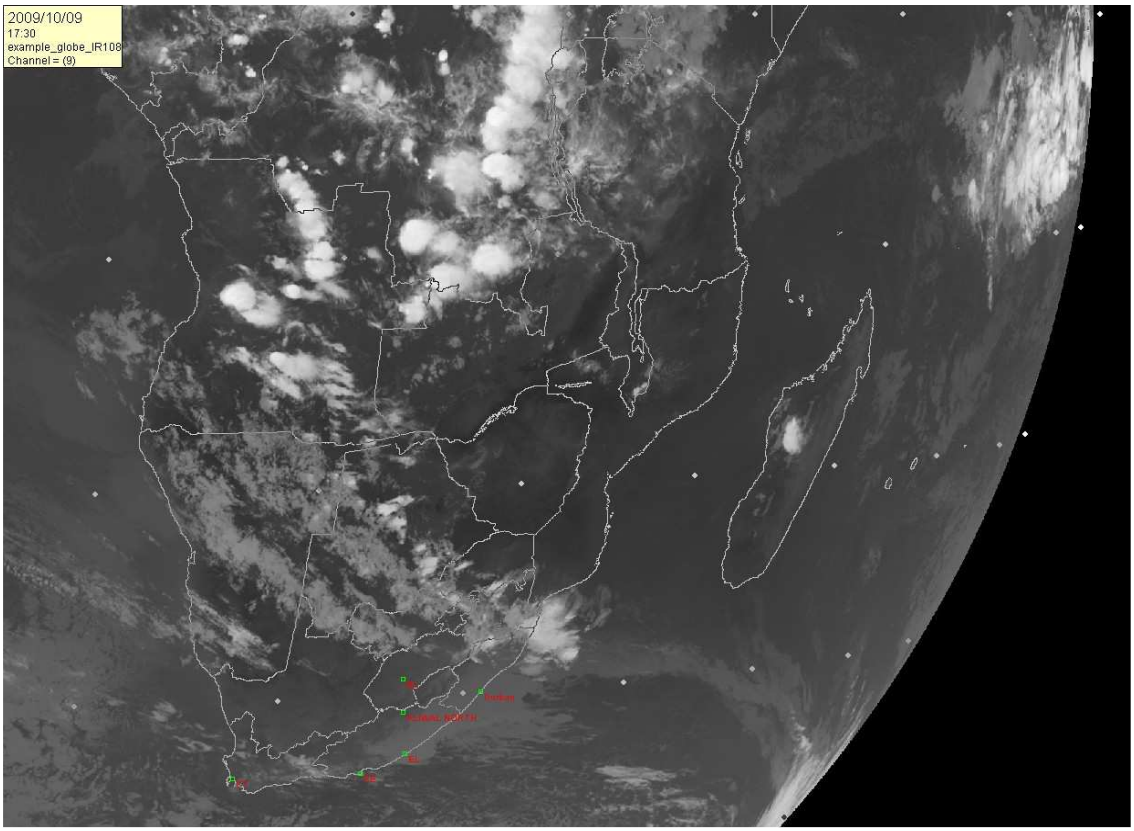

Figure 1: Satellite image dated 9 October 2009. A band of thunderstorm activity can be seen stretching from central Botswana to Maputo, covering the Pilanesberg, northern Gauteng, Witbank and Ermelo areas. These thunderstorms fall over the accident site.

1.8 Aids to Navigation

1.8.1 The helicopter was fitted with standard navigational instruments certified for this type of aircraft and there was no recorded failure prior to or during the flight.

1.9 Communications

1.9.1 The helicopter was fitted with standard communication equipment certified for this type of aircraft. There was no recorded failure of communication equipment prior to or during the flight.

1.9.2 At the time of the accident the pilot was not in contact with any air traffic control facilities.

1.9.3 Both the pilot and his passenger communicated with their wives by cell phone, informing them of their intention to return to Ermelo due to bad weather at their intended destination.

1.10 Aerodrome Information

1.10.1 The accident occurred at Pampoenkraal Farm at (S26° 46’ 51.81” E030°23’ 23.86”) GPS coordinates.

1.11 Flight Recorders

1.11.1 The helicopter was not fitted with flight recorders nor was it required by the South African Civil Aviation Regulations.

1.12 Wreckage and Impact Information

1.12.1 The helicopter was destroyed in the accident. It broke up on impact, with the debris spreading over an area of about 600m². Ground marks/scars indicate that the helicopter impacted the ground at a very steep, nose down attitude and at a high velocity.

1.12.2 Evidence also suggests that when the helicopter impacted the ground, the engine, which is situated behind the fuselage (for this type of helicopter), broke off from its frame and sliced through the fuselage. It was found embedded approximately one metre into the ground.

1.12.3 Onsite investigation revealed that the main rotor of the helicopter was turning at impact as this is evidenced by the way one half (blade) of the main rotor had dug into the ground.

Figure2: Photo showing the main wreckage.

1.13 Medical and Pathological Information

1.13.1 Both pilot and passenger were fatally injured in the accident.

1.13.2 The pathological report stated that the fatalities (death) to the occupants were ascribed to total mutilation of all body parts. According to the report all body parts had been mutilated to an unrecognisable state.

1.14 Fire

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

1.15 Survival Aspects

1.15.1 As soon as the relatives of the pilot and passenger realised that they were missing, they informed the police in Ermelo. Search and rescue was initiated immediately but due to the vastness of the search area, the aircraft wreckage was located only the following morning. It was discovered by a farm employee.

1.15.2 The accident was considered non-survivable due the high impact forces both occupants were fatally injured. Evidence also shows that when the helicopter impacted the ground, the engine, (which is situated low at the rear of the aircraft) sliced through the fuselage, with its (the engine) mass and inertia causing mutilation to the occupants.

1.16 Tests and Research

1.16.1 Onsite investigations indicated that the engine was running at the time of accident. This is supported by the fact that one half (blade) of the main rotor was imbedded into the ground showing rotation at impact. Even though the engine could not be run due to impact damage visual examination revealed that there was no malfunction at the time of the accident.

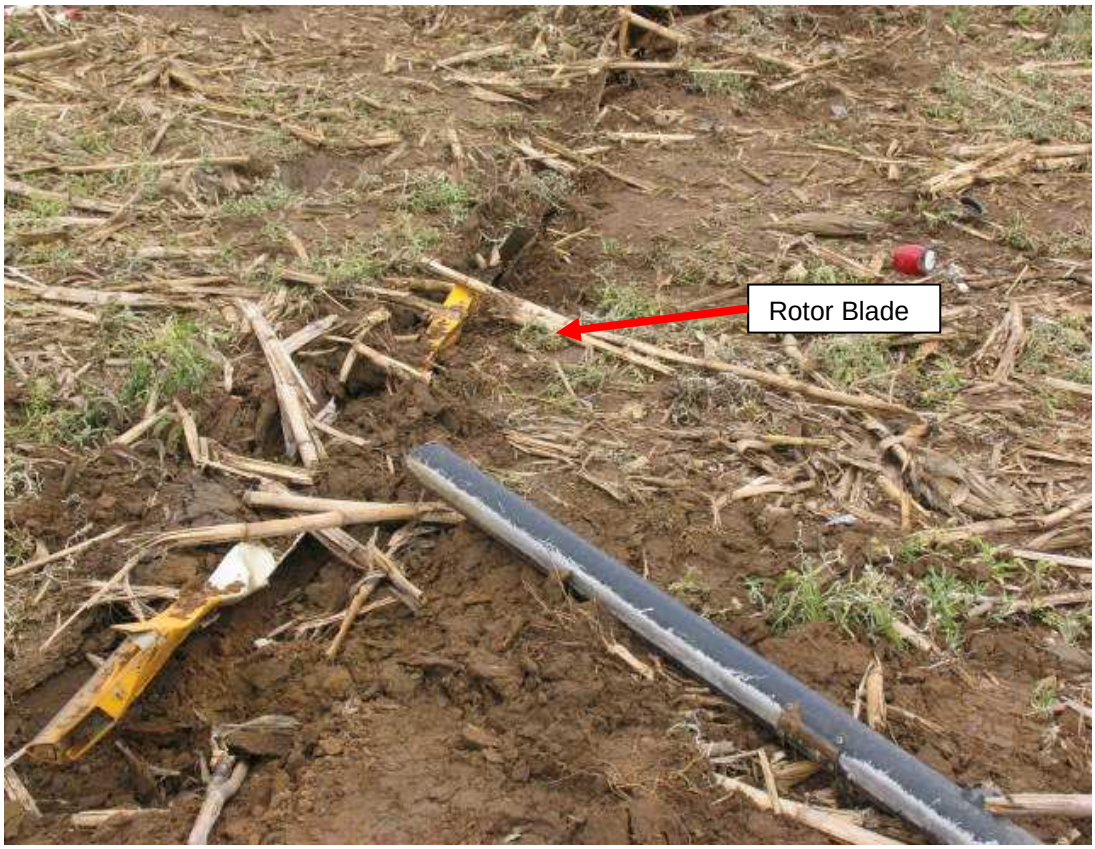

Photo 2: Showing main rotor blade imbedded into the ground

1.17 Organizational and Management Information

1.17.1 This was a private flight and the helicopter was privately owned.

1.17.2 The last mandatory periodic inspection (MPI) before the accident was certified on 4 August 2009 at 500,1 hours by an approved maintenance organisation (AMO).

1.18 Additional Information

1.18.1According to one witness who was positioned atSpringbokfontein Farm, he heard the helicopter flying overhead the farm. According to the witness it was raining and misty, and therefore he couldn't see the helicopter except for the rotating beacon. The witness further stated that he saw the helicopter descending towards the ground and then again climbing back. After a few of this manoeuvre the helicopter flew off in the direction of Ermelo and disappeared in the clouds.

1.18.2 According to the second witness who saw the wreckage on the morning of the 10 October 2009, he indicated that he heard the sound of a helicopter outside and it was misty and dark.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 When the pilot realised that he could not land at Springbokfontein Farm due to low visibility he opted to return to Ermelo.The pilot managed to get as far as Pampoenkraal Farm, a distance of about 1km (one kilometre) from Springfontein Farm.

2.2 The weather at the time of the accident had exceeded the capabilities of the pilot due to the fact that the pilot was restricted to day VFR(visual flight rules) flight only.

2.3 Due to lack of visual reference (i.e. with both the ground and the horizon not visible)the pilot lost control of the helicopter which resulted in a high velocity crash.

2.4 According to Safety Notice SN-26 from Robinson Helicopters pilots are advised not to fly helicopters at night when the weather is such that the pilot does not have outside visual reference(see appendix 1).

3. CONCLUSION

3.1 Findings

3.1 This was a private flight.

3.2 The helicopter had a valid Certificate of Registration and Certificate of Airworthiness.

3.3 The pilot's licence was valid at the time of the accident.

3.4 The pilot was restricted to flying in daytime VFR conditions, and was medically restricted to using hearing protection while flying.

3.2 Probable Cause/s

3.2.1 Loss of aircraft control due to lack of outside visual reference (spatial disorientation).

4. SAFETY RECOMMENDATIONS

4.1 None

5. APPENDICES

5.1 Appendix 1 (Robinson Helicopters Safety Notice SN-26)

Compiled by: Percy Mngqibisa

..... Date: ……..
For: Director of Civil Aviation

Investigator-in-charge: ……. Date: ……..

Co-Investigator: ……..……. Date: ……

Appendix 1

ROBINSON
HELICOPTER COMPANY

Safety Notice SN-26

Issued: Jan 87 Rev: Jun 94

NIGHT FLIGHT PLUS BAD WEATHER CAN BE DEADLY

Many fatal accidents have occurred at night when the pilot attempted to fly in marginal weather after dark. The fatal accident rate during night flight is many times higher than during daylight hours.

When it is dark, the pilot cannot see wires or the bottom of clouds, nor low hanging scud or fog. Even when he does see it, he is unable to judge its altitude because there is no horizon for reference. He doesn't realize it is there until he has actually flown into it and suddenly loses his outside visual references and his ability to control the attitude of the helicopter. As helicopters are not inherently stable and have very high roll rates, the aircraft will quickly go out of control, resulting in a high velocity crash which is usually fatal.

Be sure you NEVER fly at night unless you have clear weather with unlimited or very high ceilings and plenty of celestial or ground lights for reference.