



## AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA/18/2/3/8591	
<b>Aircraft Registration</b>	ZS-RRG	<b>Date of Accident</b>	04 December 2008		<b>Time of Accident</b>	1530Z
<b>Type of Aircraft</b>	Robinson R22 Beta II		<b>Type of Operation</b>	Private		
<b>Pilot-in-command Licence Type</b>	Private		<b>Age</b>	34	<b>Licence Valid</b>	Yes
<b>Pilot-in-command Flying Experience</b>	Total Flying Hours	101.4		<b>Hours on Type</b>	23.6	
<b>Last point of departure</b>	Tempe aerodrome, Free State Province (FATP)					
<b>Next point of intended landing</b>	Tempe aerodrome, Free State Province (FATP)					
<b>Location of the accident site with reference to easily defined geographical points (GPS readings if possible)</b>						
In an open area on a farm, 20 nm north of Bloemfontein, elevation 4 693 ft (GPS co-ordinates: S 29°22.783' E 026°12.558')						
<b>Meteorological Information</b>	Visibility good, scattered clouds, temperature 31 °C, wind 10 knots.					
<b>Number of people on board</b>	1 + 1	<b>No. of people injured</b>	0	<b>No. of people killed</b>	0	
<b>Synopsis:</b>						
<p>The pilot took off from Bloemfontein, New Tempe Aerodrome and landed at Aandgloor farm to pick up his friend. After picking up his friend, the pilot took off again and flew towards a westerly direction at an altitude of approximately 4 900 ft above mean sea level (AMSL), at 55 knots. The helicopter lost height and descended rapidly. The pilot immediately raised the collective, but the helicopter kept on descending. The helicopter ultimately made contact with the ground on the left skid, yawed to left and flipped over.</p> <p>The pilot and the passenger were not injured during the accident. The left-hand skid was destroyed, the main rotor blade was damaged, and the tail section detached from the tail boom. It is possible that the pilot attention might have been diverted while flying.</p>						
<b>Probable Cause:</b>						
It is possible that the pilot might have lost control of the helicopter and impacted with terrain.						
<b>Contributing factor/s:</b>						
Pilot low level experience.						
IARC Date				Release Date		

## AIRCRAFT ACCIDENT REPORT

**Name of Owner/Operator** : Westline Aviation CC  
**Manufacturer** : Robinson Helicopter Company  
**Model** : R22 Beta II  
**Nationality** : South African  
**Registration Marks** : ZS-RRG  
**Place** : In an open area on a farm 20 nm north of Bloemfontein  
**Date** : 04 December 2008  
**Time** : 1530Z

*All times given in this report are co-ordinated universal times (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 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 On 04 December 2008, the pilot embarked on a visual flight rules (VFR) private flight from New Tempe aerodrome. The helicopter was fuelled to full capacity prior to the flight.
- 1.1.2 Take-off was uneventful and approximately 20 nautical miles north of Bloemfontein, the pilot landed the helicopter at Aandgloor farm to pick up his friend. After picking up his friend, he took off towards a westerly direction and turned to the south at an altitude of approximately 4 900 ft above mean sea level (AMSL).
- 1.1.3 After approximately 1 nautical mile, the pilot turned towards the east at 55 knots airspeed and crossed the N6 national road. After crossing the N6, the pilot stated that the helicopter suddenly lost height.
- 1.1.4 The pilot immediately raised the collective to regain altitude, but the helicopter kept on descending. The pilot stated that he flared the helicopter to reduce the airspeed by pulling the cyclic but that did not help as it was too late and ground contact was imminent.

- 1.1.5 The helicopter made contact with the ground on the left skid, yawed to the right and flipped over. The left-hand skid was destroyed and the main rotor blade was damaged. The tail section detached from the tail boom. The main rotor head was also damaged.
- 1.1.6 The engine stopped running after ground impact. The pilot switched off all electrical switches, and unbuckled himself and the passenger. The pilot and the passenger got away from the helicopter as quickly as possible for fear of fire. Neither the pilot nor passenger sustained any injuries.
- 1.1.7 After the accident, during the interviews, the pilot indicated that there was no indication of engine failure, malfunctioning or any other signal of abnormalities. The accident happened during day time condition at GPS position S29° 22.783' E026° 12.588' Elevation 4692.

**1.2 Injuries to Persons:**

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

**1.3 Damage to Aircraft:**

- 1.3.1 The helicopter was extensively damaged.



Figure 1: View of the wreckage after impact.

#### 1.4 Other Damage:

1.4.1 None.

#### 1.5 Personnel Information:

1.5.1 Pilot-in-command:

Nationality	South African	Gender	Male	Age	34
Licence number	*****	Licence type	Private		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	31 July 2009				
Restrictions	None				
Previous Accidents	None				

Flying Experience:

Total Hours	101.4
Total Past 90 Days	23.6
Total on Type Past 90 Days	23.6
Total on Type	23.6

#### 1.6 Aircraft information:

Airframe:

Type	Robinson R22 Beta II	
Serial Number	3483	
Manufacturer	Robinson Helicopter Company	
Year of Manufacture	2003	
Total Airframe Hours (At Time of Accident)	1 938.2	
Last MPI (Date & Hours)	12 September 2008	1 896.9
Hours Since Last MPI	41.3	
C of A (Issue Date)	19 September 2003	
C of R (Issue Date) (Present owner)	03 October 2008	
Operating Categories	Standard	

1.6.1 The Robinson R22 Beta II is a two-seater, single main rotor, single-engine helicopter constructed primarily of metal and equipped with a spring and skid-type landing gear. The primary structure of the fuselage is welded steel tubing and riveted aluminium.

**Engine:**

Type	Lycoming/O-360-J2A
Serial Number	L39236-36A
Hours since New	1 986.9
Hours since Overhaul	T.B.O not reached

1.6.2 The Robinson R22 Beta II is powered by one Lycoming four-cylinder, horizontally opposed, overhead-valve, air-cooled, carburetted engine with a wet sump oil system.

1.6.3 Mass and balance:

1.6.3.1 The maximum take-off mass of the helicopter was as follows:

Empty weight:	920lbs
Pilot weight:	175lbs
Passenger weight:	175lbs
Fuel on-board:	<u>93lbs</u>
Total:	1363lbs

1.6.3.2 The mass and balance at the time of the accident was determined as follows:

Aircraft empty weight:	920lbs
Pilot weight:	175lbs
Passenger weight:	175lbs
Fuel on-board:	<u>63lbs</u>
Total:	133lbs

- 1) The maximum certified take-off mass for the Robinson R22 Beta II helicopter as per Pilot Operating Handbook (POH) is 1370lbs, indicating that the helicopter was just below its maximum take-off weight.
- 2) A total of (30lbs of fuel) was subtracted from the total fuel load for the flight from New Tempe aerodrome to where the helicopter crashed.

## 1.7 Meteorological Information:

1.7.1 The following weather information was obtained from the pilot questionnaire.

Wind direction	West	Wind speed	10 knots	Visibility	Good (10 km)
Temperature	31 °C	Cloud cover	Scattered clouds	Cloud base	None
Dew point	Unknown				

## 1.8 Aids to Navigation:

1.8.1 The helicopter was fitted with standard navigation equipment for this helicopter type as approved at the time of certification.

## **1.9 Communications:**

- 1.9.1 No difficulties with communication were reported prior to the accident or during flight.
- 1.9.2 There was no communication with air traffic control (ATC) as the helicopter was operated outside of controlled space.
- 1.9.3 The pilot broadcasted his intentions on 124.4 MHz.

## **1.10 Aerodrome information:**

- 1.10.1 The accident occurred 20 nautical miles north of Bloemfontein (GPS co-ordinates S 29°22.783' E 026°12.588'), at an elevation of 4692 ft.

## **1.11 Flight Recorders:**

- 1.11.1 The helicopter was not fitted with a flight data recorder (FDR) or a cockpit voice recorder (CVR).

## **1.12 Wreckage and Impact Information:**

- 1.12.1 The helicopter impacted the ground with the left-hand skid first causing it to break off. The main rotor blades impacted the tail boom causing the tail rotor section to separate from the tail boom. The main rotor head and the main rotor gearbox were also damaged during the accident sequence.

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

- 1.13.1 Not applicable.

## **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 because the pilot and the passenger were properly restrained and secured by making use of the four-point safety harnesses.

## **1.16 Tests and Research:**

- 1.16.1 The investigator in charge (IIC) did not find it necessary to conduct any tests or research on any part or component of the helicopter following the on-site investigation. The decision was based on the evidence that was gathered during the on-scene investigation, which indicated that the aircraft and all flying controls were intact at the time of the accident. According to available aircraft documentation no

reported defects were recorded since the last maintenance inspection was certified, nor had the pilot indicated to any of the people that he experienced any problem while flying. The helicopter had enough fuel prior the accident and the fuel tank was still intact. According to the pilot, prior the accident the helicopter including the engine performed satisfactorily.

### **1.17 Organisational and Management Information:**

1.17.1 This was a private flight.

1.17.2 The last mandatory periodic inspection (MPI) that was carried out on the helicopter was certified on 12 September 2008 by an aircraft maintenance organisation (AMO).

### **1.18 Additional Information:**

1.18.1 With reference from Human error approach to aviation accident analysis book: by Douglas A Wiegman and Scott A Shapell, page 53 to page 54: Decision errors.

- i. This unsafe act represents the actions of individuals whose hearts are in the right place, but they did not have the appropriate knowledge, or just either choose or respond poorly. However not all situations have corresponding procedures to deal with them. Therefore, many situations require a choice to be made among multiple response options. There is a situation where the problem is not well understood, and formal procedures and response options are not available. It is during this ill-defined situation when the invention of a novel solution is required.
- ii. In a sense, individuals find themselves where they have not been before, and in many ways, must literally fly by the seat of their pants. Individuals in this situation must resort to slow and effortful reasoning processes where time is a luxury rarely afforded.

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

1.19.1 None.

## **2. ANALYSIS:**

2.1 The pilot embarked on a pleasure flight from New Tempe aerodrome. Approximately 20 nm north of Bloemfontein, the pilot landed the helicopter at Aandgloor farm to pick up his friend. After picking up his friend, the pilot took off towards a westerly direction, turned south and climbed to an altitude of approximately 4 900 ft above mean sea level. The pilot then turned to the east and the helicopter suddenly lost height and descended rapidly until it impacted the ground on the left skid and flipped over.

2.2 The helicopter was properly maintained and no documented evidence was found indicating a defect or possible malfunctioning prior to the flight, which could have contributed to or have caused the accident. The helicopter was flown below the maximum take-off weight of 1370lbs. Following an interview with the pilot every

thing happened so quickly that he could not recall all the details. He stated that the helicopter had enough fuel, was flying very well and there was no sign of any abnormalities prior the accident.

- 2.3 After the investigators were informed of the status of the aircraft prior the accident, in this respect, there is a possibility that the pilot's attention and concentration may have been diverted from his immediate flying task and could not maintain airspeed while making a turn, causing the helicopter to develop a high sink rate and impact with terrain. It is the investigators opinion that the pilot did not respond on time to correct the situation. The other reason might be because the pilot did not have adequate flying experience. The pilot should have timeously employed maximum power and establish a best rate of climb speed. If ground contact cannot be avoided, maintaining a best rate of climb speed will provide the pilot with the capability of initiating and effective flare to lesson ground impact.

### **3. CONCLUSION:**

#### **3.1 Findings:**

- 3.1.1 The pilot was a holder of a valid private licence with a helicopter type licence endorsed in his logbook.
- 3.1.2 The pilot's medical expired on 31 July 2009.
- 3.1.3 The pilot and his friend were engaged in a private flight.
- 3.1.4 The pilot had no ratings at the time of the accident.
- 3.1.5 The helicopter was maintained in accordance with the approved maintenance schedule, with the last MPI prior the accident being certified on 12 September 2008.
- 3.1.6 The AME that certified the last inspection was accredited by the SACAA.
- 3.1.7 The helicopter was issued with a Certificate of Airworthiness, which was valid until 18 September 2009.
- 3.1.8 The helicopter was fuelled to full capacity prior to the flight.
- 3.1.9 The helicopter was found to be within its weight limit.
- 3.1.10 The helicopter's left-hand skid broke off and the tail section separated from the tail boom.

#### **3.2 Probable Cause/s:**

- 3.2.1 It is possible that the pilot might have lost control of the helicopter and impacted with terrain.

#### **3.3 Contributing factor/s:**

- 3.3.1 Pilot low level experience.



**4. SAFETY RECOMMENDATIONS:**

4.1 None.

**5. APPENDICES:**

5.1 There are no appendices to this report.

Submitted through the office of the SM for the Panel, November 2009.