LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/10032										
Classification	Accident	**Date**	24 August 2021	**Time**	0924Z						
Type of Operation	Helicopter Aerial Work (Part 137)										
Location											
Place of Departure	Private farm near Nylsvlei Nature Reserve	Place of Intended Landing	Private farm near Nylsvlei Nature Reserve								
Place of Accident	Private farm near Nylsvlei Nature Reserve, Limpopo province										
GPS Co-ordinates	Latitude	S 24° 41’ 17”	Longitude	E 28° 40’ 15”	Elevation	3624 ft					
Aircraft Information											
Registration	ZS-ROA										
Model/Make	Robinson R22 Beta II										
Damage to Aircraft	Substantial	Total Aircraft Hours	2293.2								
Pilot-in-command											
Licence Valid	Yes	Gender	Male	Age	38						
Licence Type	Commercial Pilot Licence (Helicopter)										
Total Hours on Type	1832.0	Total Flying Hours	9011.3								
People On-board	1 + 0	Injuries	0	Fatalities	0	Other (On Ground)	0				

What Happened

On 24 August 2021, a pilot on-board a R22 Beta II helicopter with registration ZS-ROA was engaged in a game capturing flight at a private farm near Nylsvlei Nature Reserve. The flight was conducted during day light under the provisions of Part 137 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot stated that he was operating at a height of between 50 and 100 metres (m) (164-328ft) above ground level (AGL), and above trees that were approximately 30 metres (98ft) tall. While the pilot was herding the animals towards the boma, the helicopter experienced engine power loss and descended approximately 5m (15 feet). The pilot stated that he did not observe or hear any power loss indication warning in the cockpit. After descending about 5m, the tail cone struck a tree and damaged the stabiliser assembly, which subsequently separated from the tail section. The helicopter entered an uncontrollable nose-right yaw and the pilot rolled the throttle to the off position to stop the spin. The helicopter descended towards a clearing in the bushes, impacted the ground hard, rolled slightly over to the right and came to rest in that position.

The helicopter sustained substantial damage to the tail rotor, main rotor blades and skids. The pilot was not injured during the accident sequence.

Figure 1: The helicopter at the accident site. (Source: Pilot)

Figure 2: The helicopter's severed stabiliser. (Source: Pilot)

Post-accident observations:

The trees (in Figure 1) were likely lower in height than what the pilot had stated (as 30m tall). Therefore, it is probable that the pilot was operating the helicopter at a lower height when the helicopter's tail cone struck a tree.

Extract: CAR 2011 Part 91.06.32 Minimum Heights

(1) Except when necessary for taking off, or landing, or except with prior written approval of the Director, no aircraft—
(a) shall be flown over congested areas or over an obvious open-air assembly of persons at a

height less than 1 000 ft above the highest obstacle, within a radius

(b) when flown elsewhere than specified in paragraph (a), shall be flown at a height less than 500 ft above the ground or water, unless the flight can be made without hazard or nuisance to persons or property on the ground or water and the PIC operates at a height and in a manner that allows safe operation in the event of an engine failure;

2) A helicopter shall be permitted to be flown at heights less than those prescribed in sub-regulation (1) (a), provided that—
(a) the operation is conducted without unnecessary nuisance or hazard to persons and property on the ground or water; and
(b) the PIC operates at a height and in a manner that allows safe operation in the events of an engine failure.

***CAR 2011 Part** 128.07.6 Minimum flight altitudes*

(1) The operator shall establish minimum flight altitudes for all operations carried out in accordance with IFR and the methods to determine such minimum flight altitudes for all segments to be flown which provide the required terrain clearance, taking into account the performance operating limitations referred to in Subpart 8 of this Part and the minimum altitudes prescribed in regulation 91.06.32.

(2) The operator shall take into account, when establishing minimum flight altitudes—

(a) the accuracy with which the position of the helicopter can be determined;

(b) the possible inaccuracies in the indications of the altimeters used;

(c) the characteristics of the terrain in the areas where operations are to be conducted;

(d) the probability of encountering unfavourable meteorological conditions; and

(e) possible inaccuracies in aeronautical charts.

(3) The operator shall specify in its operations manual the procedures used to determine the minimum altitudes to be flown in order to meet the obstacle clearance requirements specified in regulation 91.06.32 (2).

***Loss of Tail Rotor Thrust in Forward Flight** (Source: Robinson R22 Pilot Operating Handbook)*

R22 SERIES **EMERGENCY PROCEDURES**

LOSS OF TAIL ROTOR THRUST IN FORWARD FLIGHT

Failure is usually indicated by nose right yaw which cannot be corrected by applying left pedal.

1. Immediately enter autorotation.
2. Maintain at least 70 KIAS if practical.
3. Select landing site, roll throttle off into overtravel spring, and perform autorotation landing.

NOTE

When a suitable landing site is not available, the vertical stabilizers may permit limited controlled flight at low power settings and airspeeds above 70 KIAS; however, prior to reducing airspeed, enter full autorotation.

Probable cause:

The helicopter's tail cone struck a tree during a low-level operation, which resulted in the severing of the stabiliser assembly, as well as loss of tail rotor effectiveness. This caused an uncontrollable yaw and the subsequent crash.

Safety Action/s

None.

Safety Message and/or Safety Recommendation/s

None.

Purpose of the Investigation

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 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 apportion blame or liability****.*

About this Report

Decisions regarding whether to investigate, and the scope of an investigation are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, no investigation has been conducted, and the Accident and Incident Investigations Division (AIID) has relied on the information submitted by the affected person/s and organisation/s to compile this brief report. The report has been compiled using information supplied in the initial notification, as well as follow-up information to bring awareness of potential safety issues to the industry in respect of this occurrence, as well as possible safety action/s that the industry might want to consider in preventing a recurrence of a similar accident.

This report provides an opportunity to share safety message/s in the absence of an investigation.

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.

Disclaimer

This report is issued by:

Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa