

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10576						
Classification	Accident	Date	10 April 2025	Time	1023Z		
Type of Operation	Training (Part 141)						
Location							
Place of Departure	Rand Airport (FAGM), Gauteng province		Place of Intended Landing	Rand Airport (FAGM), Gauteng province			
Place of Occurrence	Grass strip south-east of Runway 29 at Rand Airport (FAGM)						
GPS Co-ordinates	Latitude	26°14'33" S	Longitude	028°09'04" E	Elevation	5 483 ft	
Aircraft Information							
Registration	ZS-RVG						
Make; Model; S/N	Robinson; R44 Raven II (Serial Number: 10640)						
Damage to Aircraft	Destroyed			Total Aircraft Hours	7 331.0		
Pilot-in-command							
Licence Type	Student Pilot Licence (SPL)		Gender	Male		Age	36
Licence Valid	Yes	Total Hours	37.8		Total Hours on Type	37.8	
Total Hours 30 Days	12.3		Total Flying on Type Past 90 Days	35.2			
People On-board	1 + 0	Injuries	1	Fatalities	0	Other (on ground)	0
What Happened							
<p>On Thursday, 10 April 2025, a student pilot was conducting solo consolidation circuits comprising take-offs and landings south-east of the inactive Runway (RWY) 29 at Rand Airport, Gauteng province, when the accident occurred. Visual meteorological conditions (VMC) prevailed at the time of the flight which was conducted under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>The student pilot stated that he conducted a pre-flight inspection of the helicopter, and no anomalies were observed. Thereafter, the flight instructor and the student pilot conducted two uneventful circuits and landed on the landing zone (LZ). The flight instructor disembarked from the helicopter after landing; he had a hand-held radio device to communicate with the student pilot.</p> <p>The student pilot conducted a solo circuit, but the approach was high above the LZ; therefore, he executed a go-around. The flight instructor stated that during the second solo circuit, the student pilot overshot the LZ and forced the helicopter to stop abruptly. There was a delay in the left foot pedal input from the student pilot and the helicopter yawed to the right, it subsequently entered a spin and impacted the ground.</p>							

The helicopter struck the ground tail first whilst rotating clockwise. One of the tail rotor blades sheared off and the tail boom bent at two points. One of the main rotor blades also bent, and the other sheared off near the root. The landing gear skids broke off and the main fuselage buckled after impact.

The pilot did not have visible injuries; however, he was transported to a hospital for further examination.



Figure 1: Overview of the FAGM and the accident site. (Source: Google Earth)



Figure 2: The helicopter after the accident.

Investigation

Post-investigation of the helicopter did not reveal any anomalies with the flight controls or the engine. All damage was attributed to the accident impact forces.

Loss of Control Due To Unanticipated Yaw (Source: Pilot's Operating Handbook)

Loss of control and spinning during a helicopter hover can occur due to several factors primarily related to the tail rotor's effectiveness and its interaction to the main rotor's downwash and wind conditions. Specifically, issues arise when the airflow around the tail rotor becomes turbulent or when the tail rotor loses effectiveness, leading to uncontrolled yaw.

Pilot Error. Factors like fatigue, pressure or lack of experience can contribute to errors in control inputs potentially leading to a spin.

1. Recovery from Spinning

Reduce Collective. Reducing collective can help stop a spin, but this may also cause a descent, so it is crucial to maintain a safe altitude.

Maintain Control Inputs. Applying the opposite pedal to the direction of the spin can assist in regaining control.

Initiate autorotation. If the spin cannot be stopped and ground contact is imminent, an autorotation (a safe landing with the engine off) may be necessary.

Meteorological Information

The weather information below was obtained from the meteorological aerodrome report (METAR) that was issued by the FAGM tower, recorded at FAGM on 10 April 2025 at 1000Z.

Wind Direction	220°	Wind Speed	6 kt	Visibility	10 km
Temperature	21°C	Cloud Cover	CAVOK	Cloud Base	CAVOK
Dew Point	05°C	QNH	1023 hPa	Density Altitude	7 100 ft

Findings

Personnel Information

Student Pilot

1. The student pilot had a Student Pilot Licence (SPL) that was initially issued on 15 June 2023 with an expiry date of 10 December 2025.
2. The student pilot had a medical certificate that was issued on 14 March 2023 with an expiry date of 31 March 2028.
3. The pilot had not flown in the preceding seven days prior to the accident flight due to unfavourable weather conditions for visual flight rules (VFR) flights.

Flight Instructor

1. The flight instructor had a Commercial Pilot Licence (CPL) that was initially issued on 23 March 2020 with an expiry date of 30 June 2025.
2. The flight instructor had a Grade 2 flight instructor rating that was issued on 29 November 2024 with an expiry date of 30 November 2027.
3. The flight instructor had a valid medical certificate that was issued on 7 April 2025 with an expiry date of 30 April 2026.

Helicopter

1. The helicopter was registered to the current owner on 23 November 2017.
2. The helicopter had a valid Certificate of Release to Service (CRS) with no reported defects prior to the flight. The helicopter's next mandatory periodic inspection's (MPI) due date was scheduled for 18 March 2026 or at 7383.6 hours, whichever comes first.
3. The helicopter had a Certificate of Airworthiness (C of A) that was initially issued on 1 April 2005 with an expiry date of 13 November 2025.

Mission

1. The instructor pilot reported that the student pilot overshot the landing zone and abruptly stopped the helicopter. However, he reacted late on pedal input and the helicopter yawed to the right and subsequently entered a spin which led to loss of control and a crash.
2. The helicopter struck the ground tail first and rotated clockwise, which caused one of the tail rotor blades to shear off and the tail boom to bend at two points. One of the main rotor blades was bent, and the other sheared off at the root. The landing gear skid also broke, and the main fuselage buckled due to impact with the ground. The tail and main rotor damage as well as strike marks on the grass indicated that the helicopter impacted the ground with power but at low revolutions per minute (RPM).
3. The pilot was not injured.

Environment

1. The accident occurred on the grass strip adjacent to the taxiway south of RWY 29 at Rand Airport.
2. The weather was not a factor in this accident.

Probable Cause(s)

Loss of control due to insufficient left pedal input which resulted in the helicopter yawing to the right, entering a spin and impacting the ground.

Contributing Factor(s)

None.

Safety Action(s)

None.

Safety Message and/or Safety Recommendation/s

None.

About this Report

The decision to conduct a limited investigation is based on factors, including whether the cause is known and the evidence supporting the cause is clear, the level of safety benefit likely to be obtained from an investigation and that will determine the scope of an investigation. For this occurrence, a limited 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 limited report. The report has been compiled using information supplied in the initial notification, as well as from follow-up desk top enquiries 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 occurrence.

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
<i>In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011 and 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 apportion blame or liability.</i>
Disclaimer
<i>This report is produced without prejudice to the rights of the AIID, which are reserved.</i>

This report is issued by:

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