LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10643						
Classification	Accident	**Date**	02 March 2026		**Time**	1130Z	
Type of Operation	Private (Part 141)						
Location							
Place of Departure	Ultimate Heliport, Gauteng Province	Place of Intended Landing	Ultimate Heliport, Gauteng Province				
Place of Occurrence	Kromvlei Helicopter General Flying Area (GFA), Gauteng Province						
GPS Co-ordinates	Latitude	26°21'36.29" S	Longitude	28°04'43.33" E	Elevation	4971 feet	
Aircraft Information							
Registration	ZS-RYL						
Make; Model; S/N	Bell 407 (Serial Number: 53952)						
Damage to Aircraft	Substantial	Total Aircraft Hours	8861.0				
Pilot-in-command							
Licence Type	Commercial Pilot Licence (CPL)	Gender	Male	Age	37		
Licence Valid	Yes	Total Hours	4473.2	Total Hours on Type	1598.4		
Total Hours 30 Days	38	Total Flying on Type Past 90 Days	115.3				
People On-board	2+0	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On Monday, 2 March 2026, a flight instructor (FI) and a pilot (on proficiency check training) on-board a Bell 407 helicopter with registration ZS-RYL took off on a training flight from Ultimate Heliport in Gauteng province to the helicopter general flying area (GFA) in Kromvlei in the same province, with the intention to return to Ultimate Heliport. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011, as amended.

The FI stated that the helicopter was normally flown using only the main throttle (right side); thus, the auxiliary throttle (fitted to the left seat) would generally be removed. As the flight was for training purposes, the pair needed a second throttle. Therefore, the FI and the pilot fitted the auxiliary throttle themselves. According to the crew, the FI (who was seated on the left seat) was to first demonstrate the emergency manoeuvres after which the pilot would perform, and thus, rated. The FI reported that they executed a simulated engine failure in hover and a simulated tail rotor failure from 1 000 feet (ft) above ground level (AGL), which were uneventful. The crew decided to execute a simulated autorotation as the final exercise. Whilst trying to recover the helicopter at approximately 100ft AGL, the engine failed to respond. The FI suspected a possible partially opened throttle (not fully opened). Low rotor revolutions per minute (rpm) warning light illuminated, followed by a warning sound. The

helicopter entered an uncontrolled descent and impacted the ground hard, resting on its skids; as a result, the skids became deformed, spreading sideways. Moreover, one of the rotor blades severed the tail boom. Both occupants were not injured; the helicopter sustained damage to the main rotor blades, which severed the tail boom and tail rotor, as well as the skids.

Figure 1: The ZS-RYL aircraft at the accident site. (Source: Operator)

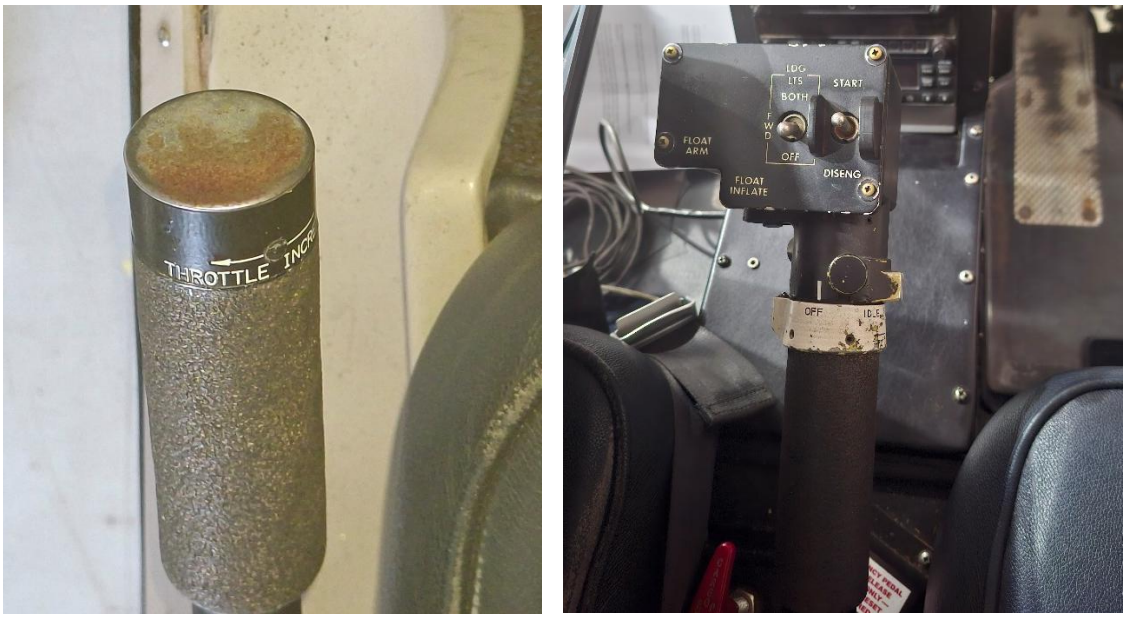
Figures 2, 3 and 4: The rotor blade that broke off (left), and the tail boom and tail rotor that were severed during the accident (centre and right). (Source: Operator)

Initial Investigation

The accident was reported to the manufacturer (Bell Helicopter) in the United States of America (USA). In response, the manufacturer appointed an accredited representative (AR) who reached out to the investigator-in-charge (IIC). The AR advised the IIC that the helicopter's engine control unit (ECU) was imbedded with an Incident Recorder (IR) chip which monitors and records certain engine parameters. On 12 March 2026, the ECU was downloaded at a SACAA-approved aircraft maintenance organisation (AMO) that was appointed by the manufacturer's AR; the download took place at the operator's hangars. The data was later sent to the manufacturer for analysis.

Manufacturer's Response After Data was Analysed

There was no data recorded during the event from the files.



Figures 5 and 6: The auxiliary throttle on the left-side pilot seat (left). The throttle for the pilot seated on the right seat (right).

Follow-up Investigation Findings

Aircraft Maintenance Engineers (AMEs), in the presence of the IIC, examined the auxiliary (left side) throttle movement, and it moved with restriction (was sticky); it did not move as smoothly as the main (right side) throttle. The pilots stated that they were aware of the stickiness of the throttle but had not reported the anomaly yet. When the IIC enquired from the operator's AMO about the last auxiliary throttle maintenance or its examination for free movement, the response was that it was an "on-condition item" and would only be checked if an anomaly was suspected.

On 1 April 2026, the AMO assisted in inspecting the auxiliary throttle and checking the throttle cable's continuation and rigging. Their findings were as follows:

1) *Co-pilot dual controls (collective throttle)*

- *Installed correctly*
- *Noted excessive/ beyond normal play on throttle grip*
- *No visible damage to collective assembly*
- *Travel ranges from 0 to idle detent smooth*
- *Travel ranges from Idle detent to Fly and to Max Nḡ (gas generator speed) stiff and binding*
- *Co-pilot (left-hand seat) collective twist grip slightly stiff but smooth in full rotation (notable difference from PIC and co-pilot throttle controls).*

NB no further inspections were carried out under co-pilot seat or tunnels.

2) Hydro-Mechanical Unit (HMU) rigging with throttle link/arm installed:

- *Fully closed: 4 degrees (not reaching stop)*
- *Idle: 38 or 39 degrees*
- *Fly: 74 degrees*
- *Full open: 95 degrees (not reaching stop by about a quarter inch)*

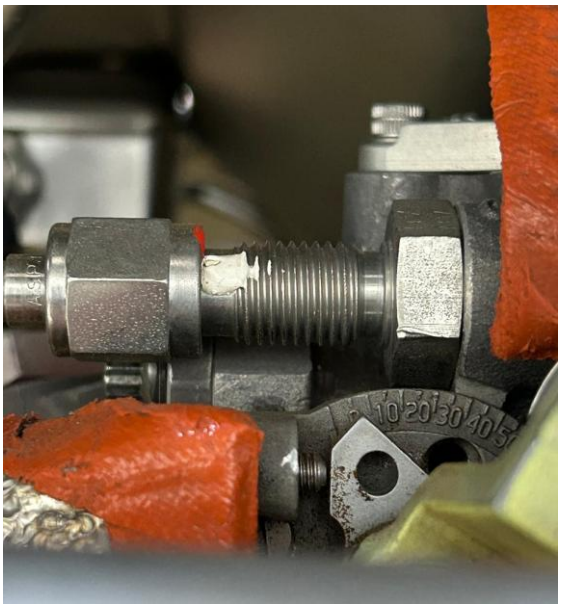
NB 3.96mm rigging pin does not go into the HMU rigging hole without manipulating the throttle control arm.

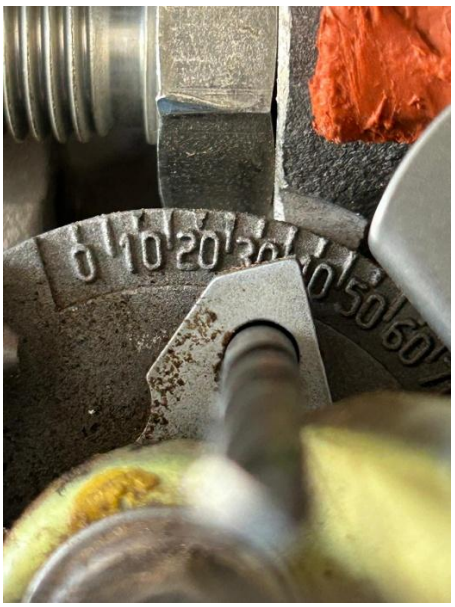
3) HMU rigging with link/arm removed:

- *Rigging parameters are consistence with parameters prescribed in maintenance manual (MM).*

4) PIC throttle control:

- *Detent block (where the ball plunger rides) has a notable wear line*
- *Notable stiffness throughout full travel range as compared to other B407's*





Figures 7 and 8: Fuel throttle gauge not reaching zero (left). A 3.99mm rigging pin is used to align the two holes (right).

Findings

1. Pilots

1.1. The FI had a Commercial Pilot Licence (CPL) Helicopter that was initially issued by the Regulator (SACAA). The licence was renewed on 25 November 2025 with an expiry date of 30 November 2026.

1.2. The FI had a Class 1 aviation medical certificate that was issued on 11 July 2025 with an expiry date of 30 November 2026. The FI had no restrictions listed in his medical certificate.

1.3 The pilot (on training) had a CPL Helicopter that was initially issued by the Regulator. The licence was renewed on 30 October 2025 with an expiry date of 30 September 2026.

1.4 The pilot had a Class 1 aviation medical certificate that was issued on 16 January 2026 with an expiry date of 31 January 2027. The pilot had no restrictions listed in his medical certificate.

2. Helicopter Information

2.1 The last maintenance inspection of the helicopter was conducted on 13 January 2026 at 8 790 total airframe hours. The inspection was certified by a SACAA-approved aircraft maintenance organisation (AMO). The helicopter was issued a Certificate of Release to Service (CRS) with an

expiry date of 12 January 2027 or at 8 940 total airframe hours, whichever comes first. The helicopter had accrued 70 hours since the last maintenance.

2.2 The helicopter had a valid Certificate of Airworthiness (C of A) that was first issued by the Regulator on 11 November 2009. The latest C of A had an expiry date of 30 November 2026. The helicopter was airworthy when it was dispatched for the flight.

2.3 The Certificate of Registration (C of R) was issued to the present owner on 11 September 2014.

2.4 The Incident Recorder (IR) chip downloaded by the AMO and analysed by the manufacturer indicated that there was no incident that exceeded recordable parameters. This also meant that the engine was operating as expected and that the throttle was likely in idle position when the accident occurred.

2.5 After the auxiliary throttle was inspected, the aircraft maintenance engineers (AME) found that it was correctly installed and there was no visible damage to the assembly. The negative findings included:

- *Travel ranges from Idle detent to Fly and to Max Ng stiff and binding.*
- *Noted excessive/ beyond normal play on throttle grip.*

Probable Cause(s)

The helicopter landed hard during a simulated autorotation due to a delayed response of the throttle recovery attributed to a lag in the collective control lever.

Contributing Factor(s)

- The auxiliary throttle was not regularly inspected.
- The throttle was exposed to environmental elements, contributing to corrosion.
- The deteriorating condition of the throttle was not reported.

Safety Action(s)

The operator and the AMO should ensure that the auxiliary throttle is maintained in accordance with the maintenance manual, as well as stored correctly. Pilots should report any unsatisfactory operation of the auxiliary throttle.

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 desktop 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

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.

Disclaimer

This report is issued by:

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