

**LIMITED OCCURRENCE INVESTIGATION REPORT**

<b>Reference Number</b>	CA18/2/3/9992						
<b>Classification</b>	Accident	<b>Date</b>	3 May 2021	<b>Time</b>	1148Z		
<b>Type of Operation</b>	Training (Part 141)						
<b>Location</b>							
<b>Place of Departure</b>	Virginia Airport (FAVG)			<b>Place of Intended Landing</b>	FAVG		
Place	Umngeni River, Durban, KwaZulu-Natal						
<b>GPS Co-ordinates</b>	Latitude	S29° 46' 15"	Longitude	E031°03'37"	Elevation	1732ft	
<b>Aircraft Information</b>							
Registration	ZS-HBR						
Model/Make	Robinson R22, Beta II						
Damage to Aircraft	Destroyed		Total Aircraft Hours	3230.4			
<b>Pilot-in-command</b>							
Licence Type	Commercial Pilot Licence		Gender	Male	Age	24	
Licence Valid	Yes						
Total Hours on Type	170.7		Total Flying Hours	533.1			
People On-board	1 + 1	Injuries	0	Fatalities	2	Other (on Ground)	0
<b>What Happened</b>							
<p>On Monday morning 3 May 2021 at about 1148Z, a Robinson R22 Beta II helicopter with registration ZS-HBR was conducting a local training flight at Virginia Aerodrome (FAVG), north-east of Durban in KwaZulu-Natal province, when the accident occurred. On-board the helicopter were the student pilot and a Grade III flight instructor.</p> <p>According to available information, the duo took off from the operator's facility at FAVG without incident and headed south towards the general flying (GF) area where they intended to perform confined area operation exercises. En route to the GF area in the proximity of Umngeni River, next to the N2 national highway intersection and after flying over the bridge, a bird impacted the helicopter's tail rotor blade. The tail rotor blade subsequently cut through the tail cone skin; and in the process, the tail rotor control bell-crank, the tail rotor drive shaft and the stabiliser were severed. The helicopter pitched down and spun out of control, whereafter, it crashed into the reeds on the bank of Umngeni River.</p> <p>No fire was reported after the accident. The South African Police Service (SAPS) and the local emergency medical services were notified of the accident. The helicopter was destroyed by impact forces and both occupants were fatally injured.</p>							



**Figure 1:** Aerial view of the helicopter in the reeds. (Source: Operator)

The eyewitness who was at the bus stop on the western side of the N2 national highway bridge reported that he saw a small white and blue helicopter approaching from the north at an estimated height of about 500 feet (ft) above ground level (AGL). According to the eyewitness, the helicopter was flying normally and seemed stable. The eyewitness then saw a flock of medium sized birds getting airborne from the reeds in the direction of the helicopter's flight path. One of the birds impacted the tail rotor and the tail cone was severed. The helicopter then pitched down and spun out of control in a nose-down attitude with the main rotor flailing, and later crashed. Fine weather conditions prevailed in the area around the time of the accident and the flight was conducted under Visual Meteorological Conditions (VMC) by day. The flight lasted about 14 minutes.

The helicopter was found lying on its right-side with the nose facing east. The cabin area was found compressed from impact. The helicopter had adequate Avgas LL100 fuel remaining in the tanks. The severed tail rotor drive shaft was found twisted, consistent with overstress fracture in torsion which emanated from vibration. A detailed examination of the flight controls revealed numerous overload failures of push-pull control tubes, but all were consistent with impact forces.

There were no flight control disconnections and no evidence of control restriction.

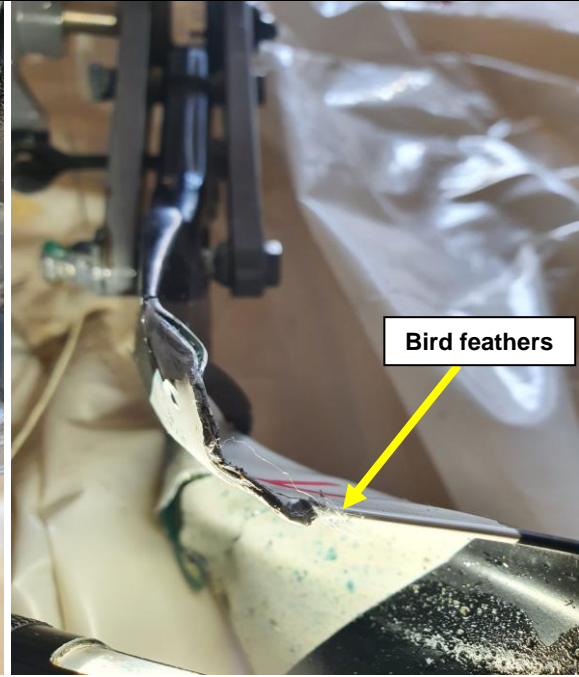
Upon examining the wreckage while focusing on the tail rotor, bird feathers were noted on one of the blades, as well as blood stains on the tail cone area. The investigators also noted several signs that indicated that the engine was running at the time of accident. The twist-grip throttle control rod attached to the engine carburettor was found at maximum power and the engine cooling fan displaying scoring around the perimeter and on the inlet cone surface indicated that it was turning at the time of accident. Witness marks on the tail rotor teetering hinge were an indication of a bird strike during normal rotation. Records indicated that the helicopter was certified, equipped and maintained in accordance with (IAW) the existing regulations and approved procedures. The helicopter had no known deficiencies before the flight and was being operated within its weight and centre of gravity limits.

The information obtained from the FAVG air traffic control (ATC) official who was on duty the morning before the accident indicated that the student pilot and the instructor seemed relaxed and in a good mood before departing and nothing abnormal was noted during their communication.

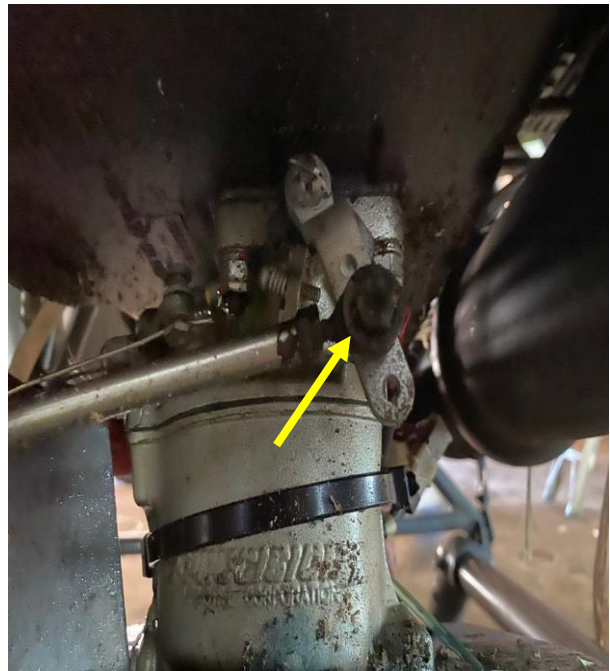
Examination of the student pilot and the flight instructor's records kept at the South African Civil Aviation Authority (SACAA) indicated that both occupants were correctly licensed and fit to undertake the flight. The flight instructor had a Robinson R22 type rating endorsement on his licence and had since accumulated 170.7 hours on type. On the day of the accident, the student pilot had accumulated about 42.4 hours on the same helicopter type.



**Figures 2 & 3:** Left picture shows the tail cone and a fractured tail rotor drive shaft; the right picture shows bird blood stains on the tail cone.



**Figures 4 & 5:** Left picture shows witness marks left on the tail rotor teetering hinge after a bird strike. Right picture shows bird feathers on the tail rotor blade.



**Figures 6 & 7:** Left picture shows the engine cooling fan area with misaligned markings on the castellated nut. Right picture shows twist-grip throttle control rod connected to the engine carburettor at maximum power.

<b>Safety Message and/or Safety Recommendation/s</b>
None.
<b>Purpose of the Investigation</b>
<i>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 <b>not to apportion blame or liability.</b></i>
<b>About this Report</b>
<i>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.</i>
<i>This report provides an opportunity to share safety message/s in the absence of an investigation.</i>
<i>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.</i>
<b>Disclaimer</b>
<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**