SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-57

LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/10050								
Classification	Accident	**Date**	9 October 2021	**Time**	0710Z				
Type of Operation	Private (Part 94)								
Location									
Place of Departure	Van Wyk Vlei, Northern Cape Province	Place of Intended Landing	Calvinia (FACV), Northern Cape Province						
Place of Accident	39nm south-west of Van Wyk Vlei, Northern Cape Province								
GPS Co-ordinates	Latitude	S 30º43'57.9"	Longitude	E 021º12' 28.4"	Elevation	3444 ft			
Aircraft Information									
Registration	ZU-ETK								
Model/Make	Autogyro MT03								
Damage to Aircraft	Destroyed	Total Aircraft Hours	408.6						
Pilot-in-command									
Licence Type	National Pilot Licence (NPL)	Gender	Male	Age	64				
Licence Valid	Yes								
Total Hours on Type	236	Total Flying Hours	649						
People On-board	1 + 0	Injuries	0	Fatalities	0	Other (on ground)	0		

What Happened

On 2 October 2021, a pilot on-board an Autogyro MT03 with registration ZU-ETK was on a long navigation flight with two other gyrocopters. The three gyrocopters took off from Pietersburg Civil Aerodrome (FAPI) in Limpopo Province, destined for Bapsfontein Aerodrome (FABP) in Gauteng Province. On 5 October 2021, the three gyrocopters took off again from FABP, made two refuel stops at Bethlehem Aerodrome (FABM) and De Aar Aerodrome (FADA), before making a full stop at Van Wyk Vlei (600 nautical miles) in the Northern Cape province. On 9 October 2021 after a three-night stay at Van Wyk Vlei, the gyrocopters' planned navigation continued from Van Wyk Vlei in a south-westerly direction to Calvinia Aerodrome (FACV), which is 148 nautical miles from Van Wyk Vlei, at an approximate height of 1000 feet (ft) above ground level (AGL).

The ZU-ETK aircraft took off with 75 litres of fuel on-board. The ZU-ETK pilot indicated that all three gyrocopters were flying abreast (extreme right). The ZU-ETK pilot stated that at 0710Z as they were approaching a rising hill, he experienced a strong wind which pushed his gyrocopter down, rendering him unable to climb out or counter the downdraught effect. The gyrocopter impacted an uneven rock surface and fell on its side. The oil cooler broke, followed by oil spillage that caught alight after contacting an extremely hot engine part. The pilot managed to free himself from the gyrocopter and tried to douse the flames with a fire extinguisher but could not put it out as the fire was intense. The gyrocopter crashed 39 nautical miles south-west of Van Wyk Vlei and it

was destroyed by post-impact fire. The pilot was not injured during the accident. The other two gyrocopters managed to climb out and evade the strong downdraught. Post-interview, the ZU-ETK pilot indicated that the on-board aircraft fire extinguisher was not effective while trying to douse the flames.

What was found:

- The ZU-ETK pilot stated that his indicated airspeed was 81 miles per hour (mph), but when he referenced the Global Positioning System (GPS) device on-board the aircraft, it indicated a ground speed of 50mph. This was confirmed by the distance they flew, which was 38 nautical miles in 01:10. In a zero-wind condition, the gyrocopters would have covered 93 nautical miles.

- Figure 1 shows a weather report from the South African Weather Service (SAWS) indicating a wind coming from the south.

Station: FACV

Date: 2021-10-09

FACV 090700Z 19002KT 9999 FEW020 SCT025 12/05 Q1021=

FACV 090800Z 19008KT 9999 FEW020 SCT025 15/05 Q1021=

Figure 1: FACV weather report on the day of the accident. (Source: SAWS)

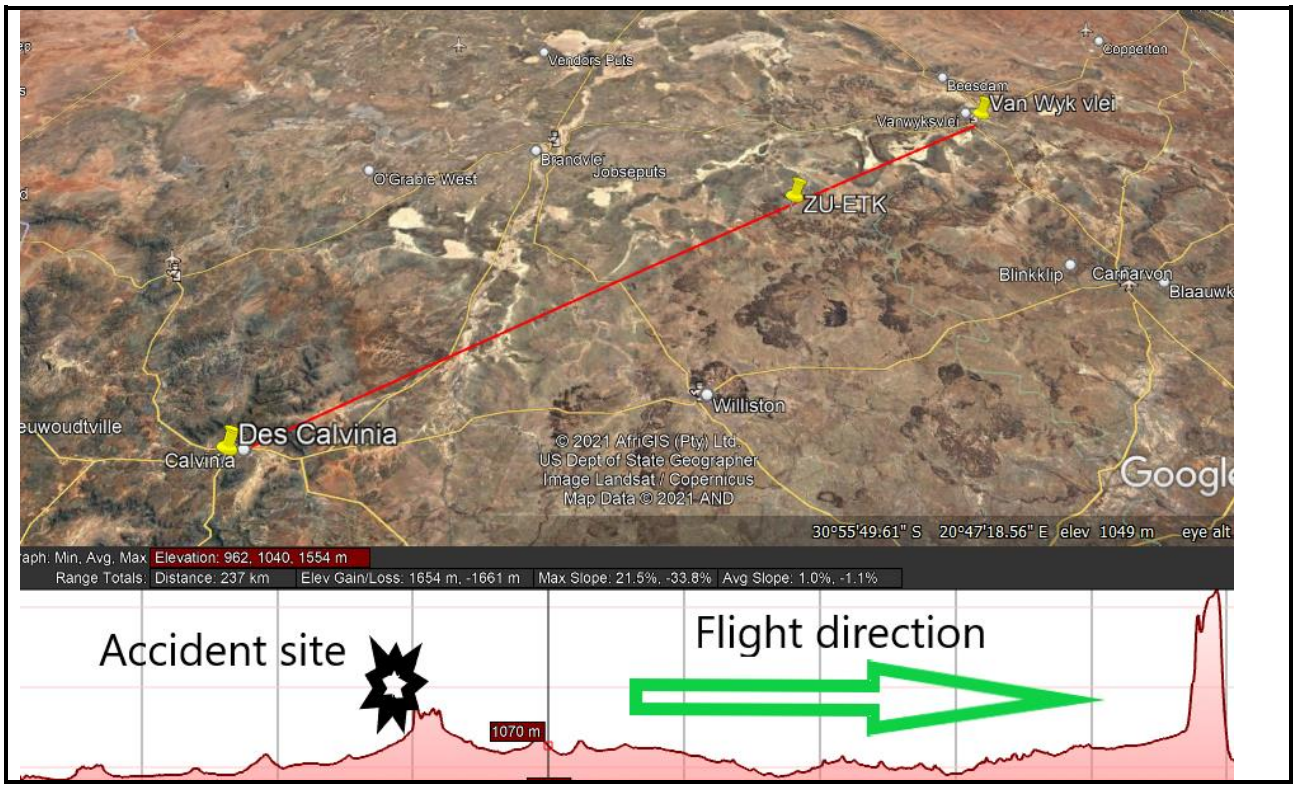

Figure 2: The rising terrain at the accident site. (Source: Google Earth)

Mountain wave turbulence
Source: https://www.atsb.gov.au/publications/2005/mountain_wave_turbulence/

Mountain waves are a different phenomenon to the mechanical turbulence found in the lee of mountain ranges and can exist as a smooth undulating airflow or may contain clear air turbulence in the form of breaking waves and 'rotors'. Mountain waves are defined as 'severe' when the associated downdrafts exceed 600 ft/min and/or severe turbulence is observed or forecast.

'Breaking waves' and 'rotors' associated with mountain waves are among the more hazardous phenomenon that pilots can experience. Understanding the dynamics of the wind is important in improving aviation safety.

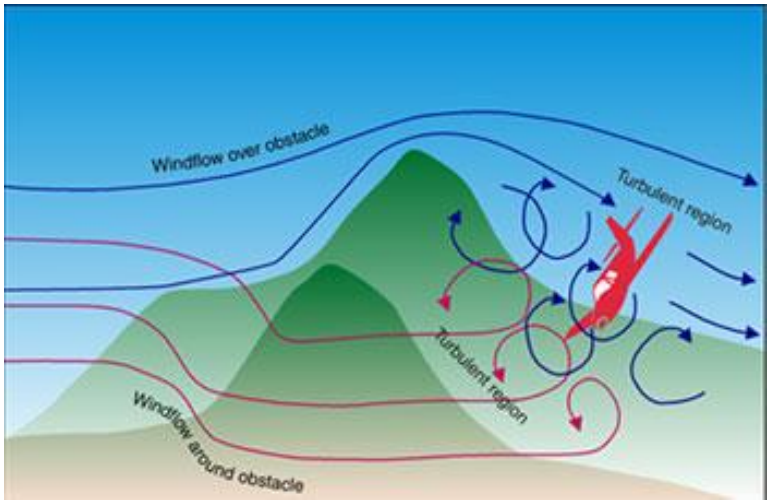

Figure 3: Turbulence on the lee side of the mountain.

Figure 4: The burnt gyrocopter laying on its right-side at the accident site. (Source: Pilot)

Probable causes:

The gyrocopter encountered a strong downdraught, and the pilot was unable to recover, resulting in the gyrocopter impacting the rocky surface hard, followed by the post-impact fire that ensued and destroyed it; downdraught.

Safety Action

None.

Safety Message

Pilots who wish to fly low and close to mountain ridges must familiarise themselves with the dangers of downdraughts or thermal sink, and how to get out of such a situation.

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