SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED ACCIDENT INVESTIGATION REPORT

Reference Number	CA18/2/3/10060					
Classification	Accident	**Date**	27 October 2021	**Time**	1349Z	
Type of Operation	Commercial (Surveillance) Part 101					
Location						
Place of Departure	Graspan, Mpumalanga Province		Place of Intended Landing	Graspan, Mpumalanga Province		
Place Accident	Graspan, Mpumalanga Province					
GPS Co-ordinates	Latitude	S25° 46" 48'	Longitude	E029° 21" 46'	Elevation	5160 feet
Aircraft Information						
Registration	ZT-UVW					
Model/Make	Mavic 2 Pro					
Damage to Aircraft	Destroyed		Total Aircraft Hours	286		
Pilot-in-command						
Licence Type	RPAS	Gender	Male	Age 37		
Licence Valid	Yes					
Total Hours on Type	35		Total Flying Hours	608		
People On-board	0	Injuries 0	Fatalities 0	Other (on ground) 0		
What Happened						

On 27 October 2021, the pilot operating a drone, the Mavic 2 Pro, with registration mark ZT-UVW was recording an organised blast at Graspan near Middleburg. The operator reported that the accident occurred during the fourth flight (1378) of the day. The remotely piloted aircraft system (RPAS) drone was stationary at 400 feet (ft) above ground level (AGL), above the blasting block whilst recording a video of a 3# (seam) burden blast when a rock propelled from the blast explosion and struck the drone. The drone was approximately 6 minutes into the flight (recording). The rock struck the drone and subsequently all connectivity with the drone was lost due to the possibility of the battery being knocked off the drone.

Following the accident, the pilot contacted the responsible blaster who assisted in the search for the drone, but without success. It was assumed that the drone fell onto the blasting block and was buried under the 109 609m³ of blasted material. Good weather conditions with surface wind of 6 knots, temperature of 21°C and good visibility prevailed at the time of the flight. There was no flight plan filed as the drone operation was conducted in an uncontrolled airspace. The drone was operated remotely in visual meteorological condition (VMC) by day and under the provisions of Part 101 of the Civil Aviation Regulations 2011 as amended.

Figure 1: The drone flight path. (Source: Operator)

Figure 2: The video footage (still) from the drone while it was still stationary above the blasting block, before blasting operation started. (Source: Operator)

Figure 2: The last (still) image of the drone recording before it was struck by a rock. (Source: Operator)

Figure 1: File picture of the drone. (Source: Operator)

The drone was issued a Certificate of Registration on 23 January 2019 with the current owner. The drone was issued a RPAS letter of approval on 16 October 2019 with an expiry date of 31 October 2022. The last mandatory periodic inspection (MPI) was carried out on 10 July 2021 at a total of 255 hours. At the time of the accident, the drone had operated for 286 hours and had accumulated 31 hours since the last MPI. The drone was issued permission by the land owner to overfly the land on 2 August 2019.

Probable cause:

The rock, propelled by the blast, struck the drone during a rock blast operation. This resulted in the drone falling into the blasting block rubble and likely got buried under the blasted material.

Contributing factor:
The drone operator misjudged the drone's safe vertical distance from blast debris.

Safety Action/s

None.

Safety Recommendations

Drone operators must determine the safe distance (vertical and horizontal) from any possible unsafe areas of operation.

The Director of Civil Aviation (DCA) to include the requirement in CAR 2011 Part 101 requiring the determination and recording of safe operating distances from areas of possible unsafe operations, unless an authorisation has been granted by the DCA to deviate.

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

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