

UAS LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10316								
Classification	Accident	Date	29 December 2022	Time	0715Z				
Type of Operation	Remotely Piloted Aircraft Systems (Surveillance) (Part 101)								
Location									
Place of Departure	Grootegeluk Mine, Lephalale, Limpopo Province		Place of Intended Landing	Grootegeluk Mine, Lephalale, Limpopo Province					
Place of Occurrence	Grootegeluk Mine in Lephalale, Limpopo Province								
GPS Co-ordinates	Latitude	23° 39' 57" S	Longitude	027° 32' 26" E	Elevation	2945 ft			
Aircraft Information									
Registration	ZT-WWR		Class	4A					
Make; Model; S/N	Premier Aviation; Cullinan PA290E (Serial Number: PAV29001E2020)								
Damage to Aircraft	Substantial		Total UAS Hours	81.28					
Pilot-in-command									
Licence Type	Remote Pilot Licence (RPL)		Gender	Male		Age	39		
Licence Valid	Yes	Total Hours	36.7	Total Hours on Type	6.56				
Total Hours 30 Days	8.05		Total Flying on Type Past 90 days	6.56					
People Controlling	1	Injuries	0	Injuries (On ground)	0	Fatalities	0	Fatal (on ground)	0
What Happened									
<p>On 29 December 2022, an Unmanned Aircraft System (UAS) with registration ZT-WWR took off on a surveillance flight at Grootegeluk Mine in Lephalale, Limpopo province. The flight was conducted under beyond visual line of sight (BVLOS) rules and under the provisions of Part 101 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>Prior to the accident flight, the pilot reported that at around 0600Z, he conducted a flight on which he measured the pits. During this flight, the pilot received an error message on the remote pilot station which stated "AP-Logger: struck thread (write)". The pilot completed the flight and, upon landing the UAS, he decided to clear the flight log in preparation for the next flight by disconnecting the UAS from the remote pilot station and connecting it to the computer to download the flight log and clear the error message. Thereafter, he took the UAS to the launch spot where he replaced the battery and prepared it for the next flight.</p> <p>The pilot launched the UAS and, during transitioning, he noticed that the wings were not connected. As he was considering his next move, he noticed the UAS descending at a high speed and impacted the ground approximately 280 metres (m) from the launch spot. The UAS was substantially damaged. No persons on the ground were injured during the accident sequence.</p> <p>The weather report that was obtained from the pilot through the pilot questionnaire presented the weather conditions as good at the time of the flight: wind speed was at 2 metres per second (m/s) with gusts up to 8 m/s.</p>									



Figure 1: The UAS route after it was launched. (Source: Operator)



Figures 2 and 3: The accident site (left) and the UAS wreckage post-accident (right). (Source: Operator)

Findings

1. The pilot was issued a Remote Pilot Licence (RPL) by the Regulator on 8 March 2022 with an expiry date of 31 October 2023. The pilot had a Class 3 medical certificate that was issued on 7 December 2022 with an expiry date of 31 December 2025. The pilot had a visual line of sight (VLOS) and a

BVLOS ratings on multirotor (MR). The pilot accumulated a total of 36.7 flying hours of which 6.56 hours were on the UAS type.

2. The UAS was initially issued a Remotely Piloted Aircraft Systems Letter of Approval (LOA) by the Regulator on 1 December 2021. The LOA was reissued on 17 October 2022 with an expiry date of 29 November 2023. The last mandatory periodic inspection (MPI) on the UAS was conducted on 24 March 2022 at 38.26 hours. A Certificate of Registration (C of R) was issued by the Regulator to the current owner on 22 December 2020.
3. The UAS maintenance was conducted by a remote maintenance technician (RMT) who had a Remote Maintenance Technician (RMT) certificate that was issued by the Regulator on 9 September 2021 with an expiry date of 8 September 2023.
4. The operator had a valid Remotely Piloted Aircraft Systems Operating Certificate (ROC) that was issued by the Regulator on 25 January 2022 with an expiry date of 31 January 2023. The UAS type, with validity from 5 October 2022 to 31 October 2023, was endorsed on the operator's operating specifications. The UAS was registered under Class 4A for BVLOS operations at a radius of 5 kilometres (km) with a height restriction of between 400ft and 1000ft above ground level (AGL).
5. The UAS's wings were not connected during pre-flight inspection, which caused the UAS to lose height after it was launched. According to the pilot, he omitted to connect the wings during the flight inspection.

Probable Cause(s)

The UAS's wings were not attached during the pre-flight inspection, which resulted in the inability of the UAS to gain lift, and it subsequently crashed to the ground.

Contributing Factor(s)

Improper pre-flight inspection.

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

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

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**This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa**