

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

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| Reference Number | CA18/2/3/10295 | | | | | | |
| Classification | Accident | Date | 2 March 2023 | | Time | 2150Z | |
| Type of Operation | Remotely Piloted Aircraft System – Surveillance (Part 101) | | | | | | |
| Location | | | | | | | |
| Place of Departure | Mabalingwe Game Reserve, Bela-Bela, Limpopo Province | | Place of Intended Landing | Mabalingwe Game Reserve, Bela-Bela, Limpopo Province | | | |
| Place of Occurrence | Mabalingwe Game Reserve in Bela-Bela, Limpopo Province | | | | | | |
| GPS Co-ordinates | Latitude | 24° 50'30.21" S | Longitude | 028° 02'55.09" E | Elevation | 3829 ft | |
| Aircraft Information | | | | | | | |
| Registration | ZT-WSI | | | | | | |
| Make; Model; S/N | DJI Matrice 210 (Serial Number: 17TDGWR13U7SX) | | | | | | |
| Damage to Aircraft | Substantial | | | Total Aircraft Hours | 133.26 | | |
| Pilot-in-command | | | | | | | |
| Licence Type | RPL Multirotor | | Gender | Male | | Age | 40 |
| Licence Valid | Yes | Total Hours | 32.33 | | Total Hours on Type | 11.48 | |
| Total Hours 30 Days | 5.37 | | Total Flying on Type Past 90 Days | 11.48 | | | |
| People Controlling | 1 | Injuries | 0 | Fatalities | 0 | Other (on ground) | 0 |
| What Happened | | | | | | | |
| <p>On 2 March 2023, a DJI Matrice 210 remotely piloted aircraft (RPA) with registration ZT-WSI was launched for surveillance purposes at Mabalingwe Game Reserve in Bela-Bela, Limpopo province. The operation was conducted under beyond visual line of sight (BVLOS) rules by night and under the provisions of Part 101 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>The pilot stated that he conducted a pre-flight inspection and no anomalies were found. The RPA's battery level (serial number: TB5514A/B) was at 99% at the time of launch, and it (RPA) climbed to 50 metres (m) above ground level (AGL) to commence the mission. The flight from waypoint 1 to 19 was uneventful. However, from waypoint 20, the pilot identified tall trees and activated the return-to-home function, but the RPA did not return to home. After 10 seconds, the RPA lost Command and Control (C2) connection with the pilot's controller unit. Therefore, the pilot set out to search for it from its last known location. He found it crashed on the ground under the lightning conductor. (It appeared that the RPA collided with the lightning conductor.)</p> <p>The RPA sustained damage to the propellers, camera and camera holder.</p> | | | | | | | |



Figure 1: The ZT-WSI after recovery. (Source: Operator)



Figure 2: The damaged arm of the RPA.

The pilot reported that he had put his trust on his colleague to correctly set the waypoint as he (the colleague) had previously flown the route without incident. The pilot flew the RPA at 50 metres (m) above ground level (AGL) which was too low, and thus, the collision with the lightning conductor at waypoint 20.

Post-accident:

The operator reviewed all the waypoint routes to ensure that controlled flight into terrain (CFIT) is not repeated. Additional training was also offered to both pilots.

Findings

1. The pilot was initially issued a Remote Pilot Licence (RPL) on 5 October 2022 with an expiry date of 31 October 2024. A visual line of sight (VLOS) and beyond visual line of sight (BVLOS) ratings were endorsed on his licence. His Class 3 medical certificate was issued on 22 August 2022 with an expiry date of 31 August 2026 with no restrictions.
2. The last inspection conducted on the RPA prior to the accident flight was on 29 December 2022 at 119.19 hours. The RPA was flown a further 14.07 hours after the said inspection.
3. The RPA was issued a Remotely Piloted Aircraft System Letter of Approval (RLA) on 8 January 2021, which was renewed on 13 December 2022 with an expiry date of 31 January 2024. The operator was issued a Remotely Piloted Aircraft System Operating Certificate (ROC) number: CAA/G1321D on 20 May 2022 with an expiry date of 31 May 2023.
4. Fine weather conditions prevailed at the time of the flight. The weather did not have a bearing to this accident.
5. The pilot was not aware that the AGL setting was at 50m prior to his mission and, thus, the RPA could not clear the lightning conductor. The RPA collided with the lightning conductor, lost connection and crashed to the ground.
6. The RPA was damaged beyond economical repair.

Probable Cause(s)

The RPA collided with a lightning conductor and lost C2 connection link, which resulted in loss of control and the subsequent crash.

Contributing Factor(s)

- The pilot was not aware that the AGL setting was at 50m (instead of above the height of the lightning conductor).
- Improper pre-flight inspection.

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| Safety Action(s) |
| Pilots are to check the correctness of all settings prior to commencing their missions. |
| Safety Message and/or Safety Recommendation/s |
| None. |
| About this Report |
| <p><i>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.</i></p> <p><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></p> |
| Purpose |
| <i>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.</i> |
| Disclaimer |
| <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**