SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10339						
Classification	Serious Incident	**Date**	18 June 2023		**Time**	1202Z	
Type of Operation	Remotely Piloted Aircraft Systems (Part 141)						
Location							
Place of Departure	Mooivallei Potchefstroom, North West Province	Place of Intended Landing	Mooivallei Potchefstroom, North West Province				
Place of Occurrence	Mooivallei Potchefstroom, North West Province						
GPS Co-ordinates	Latitude	26º49'19" S	Longitude	27º04'30" E	Elevation	4373 ft	
Aircraft Information							
Registration	ZT-UXD						
Make; Model; S/N	DJI, Phantom 4 (Serial Number: 07D2FBD0050028)						
Damage to UAS	Substantial	Total UAS Hours	37.77				
Pilot-in-command							
Licence Type	Remote Pilot Licence (RPL)	Gender	Male	Age	52		
Licence Valid	Yes	Total Hours	6108	Total Hours on Type	67.6		
Total Hours Past 30 Days	21.8	Total Flying Hours on Type Past 90 Days	4.12				
People Controlling	2	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On Sunday afternoon, 18 June 2023 at approximately 1202Z, a DJI Phantom 4 Unmanned Aircraft System (UAS) with registration ZT-UXD was engaged in a training flight when the incident occurred. The flight was conducted under beyond visual line of sight (VLOS) rules by day and under the provisions of Part 101 of the Civil Aviation Regulations (CAR) 2011 as amended.

According to the instructor pilot, a pre-flight inspection was conducted on the UAS and there were no anomalies found. During the training flight whilst the student pilot was in control the UAS was approximately 8 metres above ground level (AGL), one of the rotor blades separated from the motor hub and, as a result, the UAS lost lift and impacted the ground. The UAS was substantially damaged. There were no injuries reported on the ground.

The serious incident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 26º49'19" South 27º04'30" East, at an elevation of 4373 feet (ft).

Figure 1: The broken propellers on the UAS. (Source: Pilot)

Post-accident Investigation:

The investigation revealed that there were cracks on the UAS's propeller blades which led to multiple failures and, subsequently, caused the UAS to lose lift and propulsion and, thus, impacted the ground.

Findings

1. The instructor pilot was initially issued a Remote Pilot Licence (RPL) by the South African Civil Aviation Authority (SACAA) on 30 November 2022 with an expiry date of 30 November 2024. The licence had an instructor rating and visual line of sight (VLOS) rating endorsements. The UAS was also endorsed on the licence.

2. The instructor pilot had a valid Class 2 aviation medical certificate that was issued on 12 January 2023 with an expiry date of 31 January 2028.

3. The student pilot had a valid Class 2 aviation medical certificate that was issued on 26 January 2024 with an expiry date of 31 January 2028.

4. The UAS had a valid Certificate of Registration (C of R) which was issued on 1 March 2019.

5. The operator had a valid UAS Letter of Approval (LOA) which was initially issued on 20 April 2021. The LOA was reissued on 30 April 2023 with an expiry date of 30 April 2024.

6. The operator had a valid Approved Training Organisation (ATO) Certificate which was issued on 1 August 2022 with an expiry date of 31 October 2023.

7. The operator had a valid Landowner Permission Certificate to conduct operations, which was issued on 15 April 2019.

8. The last MPI was carried out on 21 February 2023 at 33.17 hours at the time of accident the UAS had a total of 33.77 hours it has flown 0.6 hours.

9. The investigation revealed cracks on the UAS's propeller blades which led to multiple failures and, subsequently, caused the UAS to lose lift and propulsion and, thus, impacted the ground.

Probable Cause

The rotor blades of the UAS disintegrated during the flight due to cracks. The UAS lost lift and propulsion and impacted the ground.

Contributing Factor

None.

Safety Action(s)

None.

Safety Message

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