SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10238										
Classification	Accident		**Date**	10 November 2022			**Time**	1230Z			
Type of Operation	Multispectral Scan of Yacht (Part 101)										
Location											
Place of Departure	Support Boat, 2nm North of Granger Bay, Western Cape Province			Place of Intended Landing			Support Boat, 2nm North of Granger Bay, Western Cape Province				
Place of Occurrence	2.3nm North of Granger Bay (South Atlantic Ocean), Western Cape Province										
GPS Co-ordinates	Latitude	33° 51' 50.11" S		Longitude	18° 25' 41.25" E		Elevation	-76 ft			
Aircraft Information											
Registration	ZT-WKE										
Make; Model; S/N	DJI; Matrice 210 (171DGCMR13JTE7)										
Damage to Aircraft	Unknown (Lost)				Total Aircraft Hours		119.0				
Pilot-in-command											
Licence Type	Remote Pilot Licence (RPL)			Gender	Male			Age	38		
Licence Valid	Yes	Total Hours		745.5		Total Hours on Type			0.3		
Total Hours Past 90 Days	32.0			Total Flying Past 90 Days on Type			0.3				
People Controlling	1	Injuries	0	Fatalities	0		Other (on ground)		0		

What Happened

On 10 November 2022, a pilot operating a remotely piloted aircraft (RPA) with registration ZT-WKE was conducting a multispectral scan of the yacht at Granger Bay in the Western Cape province. The flight was conducted under visual line of sight (VLOS) by day and under the provisions of Part 101 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot stated that he conducted a thorough pre-flight check and all telemetry read normal. He then launched the RPA from a support boat, which was approximately 50 metres (m) from the yacht. About 15 minutes into the flight whilst the RPA was above the yacht at 50m above sea level (ASL), the pilot heard an unfamiliar sound coming from the RPA. Soon after, he observed the RPA in a rapid descent. His initial reaction was to increase the throttle to stop the descent, however, this input did not stop the RPA from descending towards the ocean. The pilot then induced the roll input to move the RPA away from the yacht. But just before the RPA hit the water, the pilot noticed the propeller blade floating (in the ocean). As soon as the RPA hit the water, the skipper and the pilot raced towards the RPA. However, by the time they reached the crash site, the RPA had already submerged into the ocean.

There was no injury to persons or damage to property. The RPA could not be recovered from the ocean.

Figure 1: A picture of the RPA type, the DJI Matrice 210. (Source: Manufacturer)

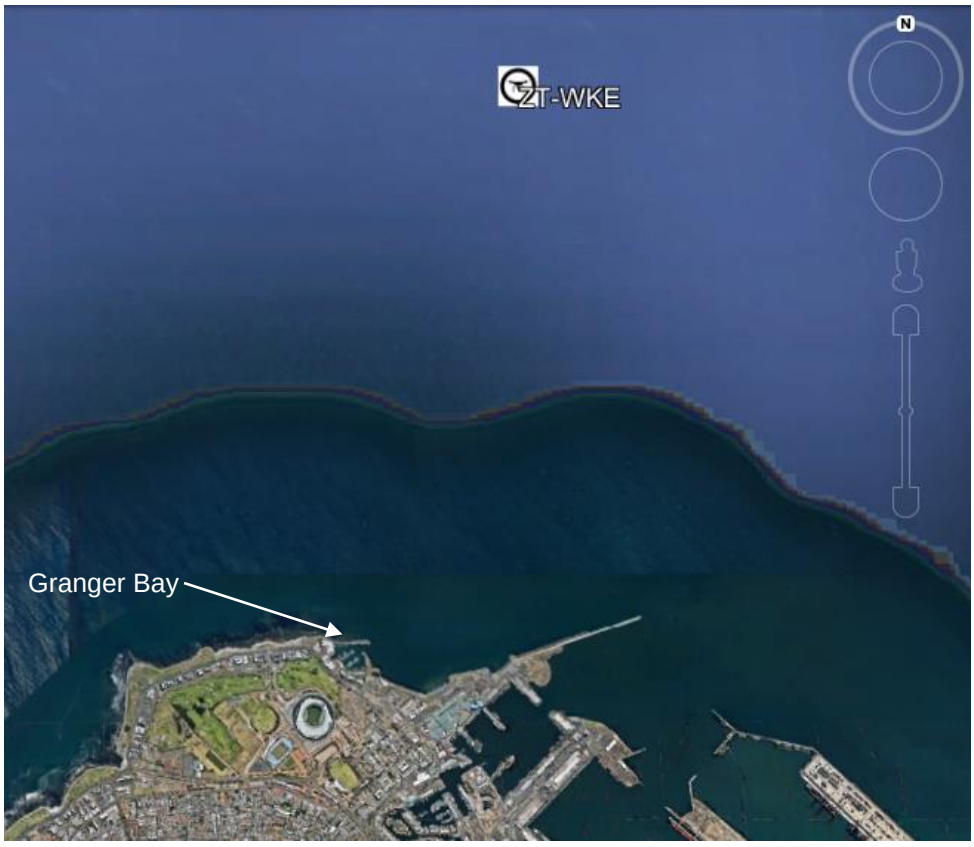

Figure 2: Last place where RPA submerged into the ocean. (Source: Google Earth)

Findings

1. The pilot was issued a Remote Pilot Licence (RPL) with a visual line of sight (VLOS) type rating endorsement on 8 September 2022, valid until 30 September 2024. His Class 3 medical certificate was issued on 6 October 2020 with an expiry date of 31 October 2024. The pilot had no medical restrictions on his medical certificate.

2. The operator had a Remotely Pilot Aircraft Systems (RPAS) Operating Certificate (ROC) which was issued on 28 July 2022 with an expiry date of 31 July 2023. The RPA was initially issued a Remotely Piloted Aircraft Letter of Approval (LOA) on 10 June 2021 with an expiry date of 30 June 2023.

3. The mandatory periodic inspection (MPI) that was carried out on the RPA prior to the accident flight was conducted on 19 October 2022 and was certified at 116.3 airframe hours. During the MPI, the motor system was inspected and found to be turning smoothly, the propellers were inspected for signs of stone chips and stress cracks, and none were found. The battery charge status was also checked and found to be in good working condition. The RPA flew a further 3 hours since the last MPI inspection.

4. The weather information below was obtained from the Meteorological Aerodrome Report (METAR) that was issued by the South African Weather Service (SAWS) on 10 November 2022 at 1230Z, recorded at Cape Town International Airport (FACT) which is 10nm from the accident site.

   FACT 101230Z 21014KT 9999 FEW030 25/11 Q1013 NOSIG=

Wind Direction	210°	Wind Speed	14kts	Visibility	9999m
Temperature	25°C	Cloud Cover	FEW	Cloud Base	3000ft
Dew Point	11°C	QNH	1013hPa		

5. Post-accident log analysis report (Source: Manufacturer)
   What could be seen on the flight log is that the RPA went out of control in the last 2 seconds, and at that point the pilot pushed both sticks forward (up and forward). This indicated that the pilot tried to avoid something quickly. Thereafter, the drone just switched off.

   The pilot stated that after the RPA lost height, he increased the throttle to stop the descent. This corresponds with the manufacturer's analysis above.

Probable Cause(s)

One of the RPA's propeller blades detached in-flight, which led to the loss of control and the rapid descent into the ocean. The cause of the propeller blade detaching from the RPA could not be determined.

Contributing Factor(s)

None.

Safety Action(s)

None.

Safety Message and/or Safety Recommendation/s

None.

About this Report
Decisions 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
This report is produced without prejudice to the rights of the AIID, which are reserved.

This report is issued by:

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