

REPUBLIC OF KENYA



MINISTRY OF ROADS AND TRANSPORT
STATE DEPARTMENT FOR TRANSPORT
AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT

**INVESTIGATION REPORT OF AN OCCURRENCE INVOLVING A
CESSNA 180A, REGISTRATION 5Y-FOO ON 17 APRIL 2021 AT
MAGADI IN KAJIADO COUNTY**

AIRCRAFT ACCIDENT INVESTIGATION

OPERATOR	:	Private (S.G. Herd)
AIRCRAFT TYPE	:	Cessna 180A
MANUFACTURER	:	Textron Aviation Inc.
YEAR OF MANUFACTURE	:	1957
AIRCRAFT REGISTRATION	:	5Y-FOO
AIRCRAFT SERIAL NUMBER	:	180-32756
DATE OF REGISTRATION	:	05 May 2017
NUMBER AND TYPE OF ENGINE	:	One, Continental 0-470-50
DATE OF OCCURRENCE	:	17 April 2021
LAST POINT OF DEPARTURE	:	Oldorko, Magadi, Kajiado County
POINT OF INTENDED LANDING	:	Wilson Airport, Nairobi
TIME OF OCCURRENCE	:	0600 (0900)
LOCATION OF OCCURRENCE	:	Oldorko (1°53'57"S, 36°13'42"E)
TYPE OF FLIGHT	:	Private
NUMBER OF PERSONS ON BOARD	:	04
INJURIES	:	None
NATURE OF DAMAGE	:	Substantial
CLASS OF OCCURRENCE	:	Accident
PILOT IN COMMAND	:	PPL holder
PIC FLYING EXPERIENCE	:	800.4 hours

All time given in this report is Coordinated Universal time (UTC), with East African local time in parenthesis

OBJECTIVE

This report contains information which has been determined up to the time of publication. The information in this report is published to inform the aviation industry and the public of the general circumstances of the accident.

This investigation has been carried out in accordance with *The Kenya Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2018 and Annex 13 to the ICAO Convention on International Civil Aviation*.

The sole objective of the investigation of an accident or incident under these Regulations shall be the prevention of accidents and incidents. It shall not be the purpose of such an investigation to apportion blame or liability.

The information contained in this report is derived from the data collected during the investigation of the occurrence.

INVESTIGATION PROCESS

The occurrence involved a privately owned and operated Cessna 180A aircraft registration 5Y-FOO, and was notified to the Aircraft Accident Investigation Department (AAID), State Department for Transport (SDT), Ministry of Roads and Transport through a phone call by Wilson Airport Air Traffic Control.

AAID investigator on standby duty was deployed to the site for initial onsite investigation and witness interviews.

After the initial on-site investigation phase, the occurrence was classified as an “Accident” owing to the substantial damage to the Aircraft. No injuries were reported.

In accordance with ICAO Annex 13 protocols, AAID notified National Transportation Safety Board (NTSB) of United States of America as the aircraft accident investigation authority of the State of Manufacture and Design of the aircraft and engine respectively.

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LIST OF ABBREVIATIONS/GLOSSARY OF TERMS

AAID	-	Aircraft Accident Investigation Department
AMO	-	Approved Maintenance Organization
AMSL	-	Above Mean Seal Level
ELT	-	Emergency Locator Beacon
ft	-	Foot (feet)
KCAA	-	Kenya Civil Aviation Authority
PPL	-	Private Pilots' License
TSCO	-	Time Run Since Complete Overhaul
TSN	-	Time since New
TTSN	-	Total Time Since New
VFR	-	Visual Flight Rules

**Photos and figures used in this report are taken from different sources and may be adjusted from the original for the sole purpose of improving the clarity of the report. Modifications to images used in this report are limited to cropping, magnification, file compression or enhancement of colour, brightness, contrast or addition of text boxes, arrows or lines.*

SYNOPSIS

On 17 April 2021, an accident occurred at Oldorko village, adjacent to Ole Ikonet escarpment at the shores of Lake Magadi in Kajiado County involving a privately owned and operated Cessna C180A aircraft registration 5Y-FOO.

The accident aircraft destined for Wilson airport with four persons on board crashed on takeoff run after the left wing tip struck a tree. This resulted in the aircraft veering off the runway to the left and subsequently ground looped, coming to a stop on its right side with the left wing facing up and the aircraft facing 90 degrees to the left of intended travel. The right wing broke off its root.

The aircraft was flown by a PPL holder who is also its owner/operator. All on board exited the aircraft with no injuries. There was no fire.

The aircraft sustained substantial damage. The right wing broke off at its root, the horizontal stabilizer broke off at the midsection, propeller blades were damaged, the right main landing gear wheel detached from its hub and there was damage to the left-wing tip.

The probable cause of the accident was identified as:

The pilot's failure to maintain directional control of the aircraft leading to inadequate clearance with obstacles on the ground resulting in an accident.

1. FACTUAL INFORMATION

1.1. History of Flight

On 17 April 2021 at about 0600 (0900), a Cessna C180A aircraft registration 5Y-FOO performing a private flight from Oldorko at the shores of Lake Magadi, Kajiado County to Wilson Airport, Nairobi County crashed on takeoff run at Oldorko makeshift grass runway. On board were four occupants. At the time of the accident, the pilot, a PPL holder, was the owner/operator of the aircraft.

On takeoff run, at 150m past the runway threshold, the left-wing tip struck a tree. This resulted in the aircraft veering off the runway to the left and subsequently ground looped, coming to a stop on its right side with the left wing facing up and the aircraft facing 90 degrees to the left of intended direction of travel. The right wing broke off its root.

All on board exited the aircraft with no injuries. There was no fire.

The aircraft sustained substantial damage. Its right wing broke off at the root, the horizontal stabilizer broke off at the midsection, propeller blades were damaged, the right main landing gear wheel detached from its hub and there was further damage to the left-wing tip.

Visual meteorological conditions prevailed at the time of the accident.



FIGURE No. 1 – Aerial view of Lake Magadi (source: Google earth with AAID annotations)



FIGURE No. 2 – Aerial view of the accident site (source: Google earth with AAID annotations)

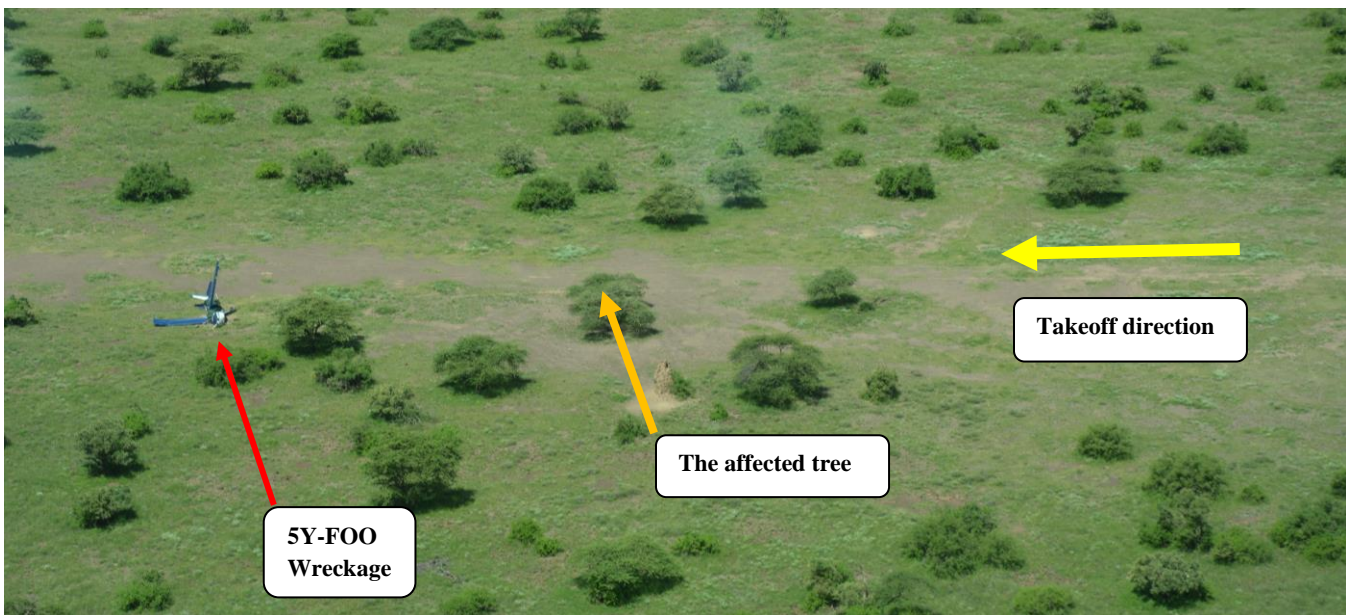


FIGURE No. 3– Aerial photo of final position of the accident aircraft



Affected section of the left wing tip

FIGURE No. 4 – A photo of 5Y-FOO accident site



The affected tree

FIGURE No. 5 – A photo of 5Y-FOO accident site with the affected tree in the background

1.2. Injuries to persons

Injuries	Crew	Passengers	Others
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Fatal	0	0	0
Serious	0	0	0
Minor/None	1	3	

1.3. Damage to Aircraft

The aircraft was substantially damaged. The right main landing gear wheel detached from its hub. Both propeller blades exhibited rotational damage. The right wing broke off at its root, and the horizontal stabilizer broke off at the midsection.

Post occurrence visual examination of the aircraft revealed no deficiencies prior to the accident.

1.4. Other damage

Not applicable

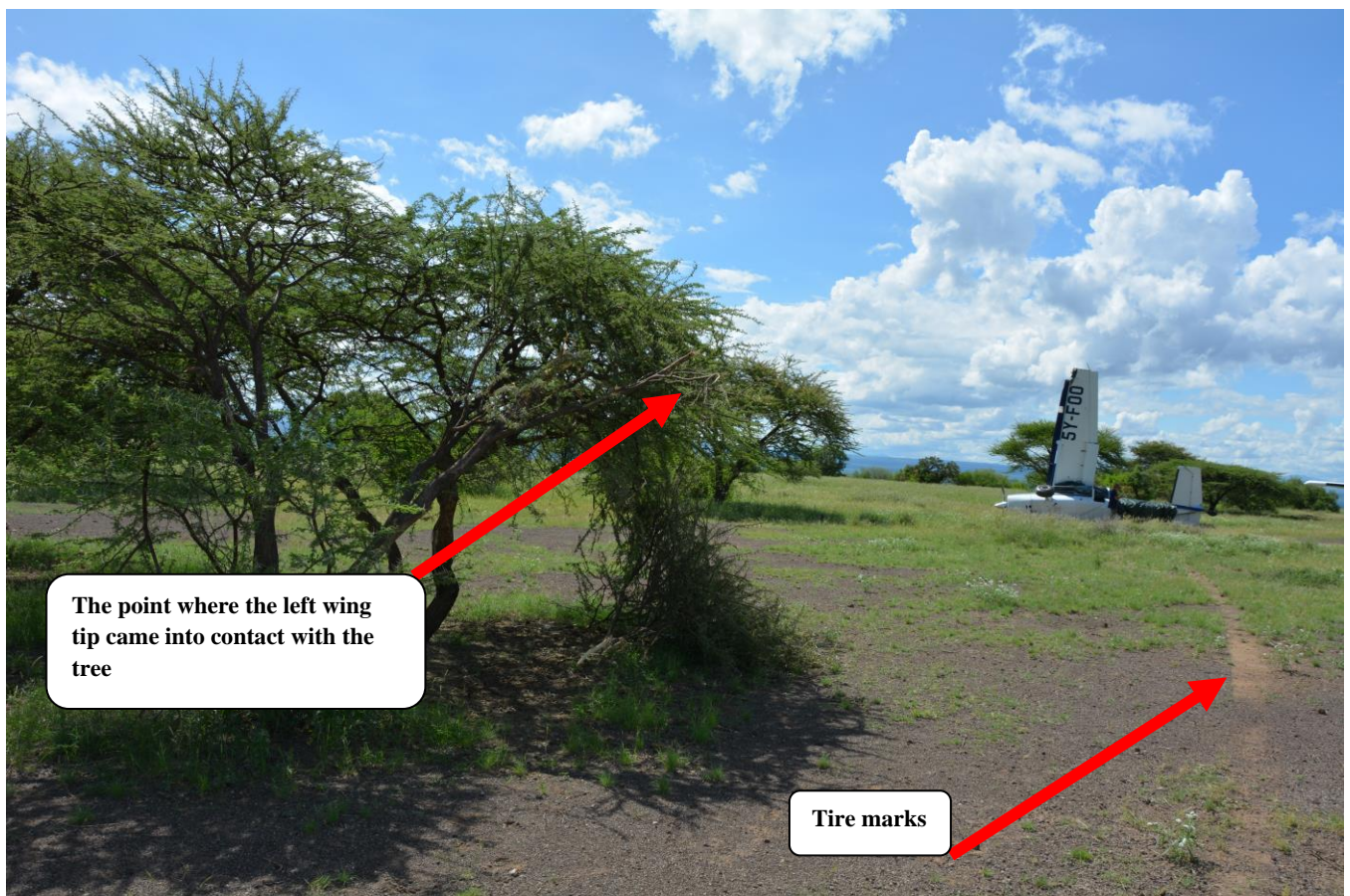


FIGURE No. 6 – A photo of 5Y-FOO, the affected tree and tire marks

1.5. Personnel Information

1.5.1 The Pilot

At the time of the accident, the 55-year-old male pilot held a PPL (Aeroplane) first issued on 15 December 2009. The current renewal was issued on 21 July 2020 and valid until 30 July 2021. The current renewal of Flight Radio Telephony Operators Licence was issued on 21 July 2021 and valid until 25 July 2022. A Class 2 Medical Certificate with no limitations/restrictions, was issued on 21 July 2020 and valid until 30 July 2021 in accordance with the current Kenya Civil Aviation Authority (KCAA) personnel licensing requirements.

Pilot license	PPL (Aeroplane)
Medical expiry date	30 July 2021
Total flying hours	800.4
Total flying hours on type	131.45
Hours, last 90 days	12.25
Hours, last 30 days	5.50
Hours, last 07 days	3.00
Hours, last 24 hours	0.30
Ratings	Landplanes – (Ultra-light and Group A)

1.6. Aircraft Information



FIGURE No. 6 – A photo of 5Y-FOO prior to the accident (photo, courtesy of the operator)

The occurrence aircraft was a Cessna C180A aircraft, serial number 180-32756. It is a four seat, high wing light aircraft powered by a Continental O-470-50, 230 HP at 2700 RPM, six-cylinder, horizontally

opposed, reciprocating engine. The airframe is all-metal, constructed of aluminum alloy. The fuselage is a semi-monocoque structure, with exterior skin sheets riveted to formers and longerons. The strut-braced wings, likewise, are constructed of exterior skin sheets riveted to spars and ribs. The landing gear is in a conventional arrangement, with main gear legs made of spring steel, and a steerable tailwheel mounted on a hollow tapered steel tube.

Manufacturer	Textron Aviation Inc.
Type, model, Serial number	Cessna, C180A, 180-32756
Nationality / Registration Mark	Kenyan, 5Y-FOO
Name of Operator	Private
Certificate of Registration issued on	05 May 2017
Certificate of Airworthiness first issued on	24 August 2018
Current Certificate of Airworthiness issued on	08 October 2020
Current Certificate of Airworthiness valid until	07 October 2021
Total airframe time	2,957.3 hours
Engine type (No., Type, Model, Serial No.)	1No., Continental, O-470-50, 48938-1-K-4
Propeller (No., Type and Serial No.)	1No., Hartzel propellers Inc. (PHC-C3YF-1-FR, EE5863B)
Fuel type used	AVGAS

1.6.2 Maintenance Records

At the time of the accident, the aircraft had a valid Certificate of Airworthiness (C of A) in the General Aviation Category issued by KCAA on 08 October 2020, valid until 07 October 2021. The aircraft had no known deficiencies prior to and during the flight. A review of the aircraft records indicated that it was certified, equipped, and maintained in accordance with existing KCAA regulations and approved procedures. The most recent scheduled 50/100 hours maintenance check for renewal of C of A was conducted on 22 September 2020 and a class 1 CRS issued. The check was performed by Light Plane Maintenance Ltd at Airspray company premises in Naivasha, Nakuru County. At this time, the aircraft had flown 2,944.2 hours (TTSN).

At the time of the accident, the aircraft had flown 2,957.3 hours (TTSN) and 13.1 hours since renewal of C of A, the engine had flown 2,957.3 hours (TTSN) and 143.3 hours (TSCO) and the propeller had flown 538 hours (TTSN) and 124.7 hours (TSCO) respectively.

1.6.3 Mass and Balance

The mass and centre of gravity were within the prescribed limits and hence not considered a factor.

1.7. Meteorological Information

Visual meteorological conditions prevailed at the time of the accident. The weather at Oldorko and its environs was suitable for a VFR flight.

Analysis of prevailing weather conditions by the Kenya Meteorological Department indicated that at the time of the accident, no significant severe weather was observed based on recorded meteorological data.

The prevailing weather conditions observed between (0530) 0830 and (0630) 0930 comprising no significant rains, light to moderate winds, broken clouds and good visibility posed no aviation hazard (no rainfall, surface winds of 5 Knots, visibility of more than 10 KM, and broken clouds at 2,500 ft).

1.8. Aids to Navigation

Not applicable. The accident flight was operated under VFR, during which the aircraft was required to remain clear of cloud and in sight of the surface. Aids to navigation was not considered a factor in this occurrence.

1.9. Communications

The aircraft was equipped with a two way Very High Frequency (“VHF”) radio. Communication was not considered a factor in this occurrence.

1.10. Aerodrome Information

Oldorko is located on the shores of Lake Magadi at latitude 1° 53' 57.71" S and longitude 36° 13' 46" E, and elevation 2,470 ft AMSL. It is an unpaved makeshift field runway where overnight campers land and takeoff from. It is not a designated aerodrome. At the time of the accident the field surface was covered with grass and its condition was dry with loose chippings and a few trees to the sides.

The nearest designated airstrip is Magadi airstrip (HKMG) which has a single unpaved runway that measures 5,741 feet (1,750 m) long. It is located on the shores of Lake Magadi at latitude 01° 56' 49.2360" S and longitude 036° 16' 48.0072" E, elevation 2,100 ft AMSL and to the south east of Oldorko.

1.11. Flight Recorders

Not applicable. The aircraft was not equipped with flight recorders. Flight recorders are not required by KCAA regulations for this category of aircraft.

1.12. Wreckage and Impact Information

The main body of the aircraft came to rest largely intact facing 90° to the left of the intended direction of flight. The aircraft rested on its right side with the left wing facing up. The right wing broke off its root, the horizontal stabilizer broke off at the midsection and the propeller blades were damaged. The right main landing gear wheel detached from its hub and there was further damage to the left wing tip and its fairing.

The distance between the threshold and the location of the struck tree was 150 metres and the location between the tree and where the aircraft came to rest was 52 metres.

1.13. Medical and Pathological Information

The pilot was not on prescribed drugs. No tests were conducted to check if his performance was affected by fatigue, alcohol, drugs and/or medication at the time of the accident.

1.14. Fire

There was no fire. Fuel saturation was evident on the ground.

1.15. Survival Aspects

The occurrence was survivable. All on board survived uninjured and exited the aircraft unaided. The seats and harnesses were all intact and showed no sign of damage.

The ELT was installed and did not activate.

1.16. Tests and Research

Not applicable.

1.17. Organizational and Management Information

1.17.1. Operator

Aircraft Owner/Operator: Private

Address: Nairobi, Kenya

The aircraft was operated under the General Aviation category.

1.18. Additional Information

Not applicable.

1.19. Useful and Effective Investigative Techniques

Not applicable.

2. ANALYSIS

2.1 General

2.1.1

The weather condition at the time of accident was within the limits for operations under VFR and considered suitable for the pilot to conduct his flight.

2.2 Licensing and flying experience Aspects

2.2.1

The pilot was entitled to act as pilot-in-command of the accident flight with his valid PPL.

At the time of the accident, the pilot had flown a total of 800.4 hours and 131.45 hours on a Cessna C180A.

2.3 Engineering Aspects

2.3.1

The aircraft had a valid Certificate of Airworthiness at the time of the accident, and no irregularities were found in the maintenance history.

2.3.2

The aircraft had no outstanding defects and was serviceable for the occurrence /flight.

2.4 Analysis of the Accident Flight

2.4.1

The runway surface

2.4.1.1

The runway surface was uneven, covered with grass, and its condition was dry with loose chippings and trees dotting to the sides and close to the makeshift runway.

2.4.2

Damage to the aircraft

2.4.2.1

The aircraft sustained substantial damage. Its right wing broke off at the root, the horizontal stabilizer broke off at the midsection, all propeller blades were damaged, the right main landing gear wheel detached from its hub and there was further damage to the left wing tip.

2.4.2.2

From examining the aircraft damage and tire marks aforesaid, it was determined that the aircraft never left the ground prior to the accident.

2.4.3

Aircraft Movement

2.4.3.1

The track of the aircraft could be traced by a tire marks continuing from the runway threshold to the final stop position. The first segment of the tire marks from the threshold to about 140 metres was faint while the remaining was more profound. The second segment of the tire marks revealed that the wheels were pressing deep on the runway surface.

2.4.3.2

The left main landing gear wheel was detached from its assembly.

2.5

Pilot Action

2.5.1

On takeoff run, the pilot deviated to the left and the aircraft's left wing tip struck a tree leading to loss of directional control on ground leading to the accident.

3. CONCLUSIONS

3.1 Findings

3.1.1 The weather conditions at the time of accident were within the limits for operations under VFR and considered suitable for the pilot to conduct the flight.

3.1.2 The aircraft had a valid Certificate of Airworthiness and was maintained and certified in accordance with the regulatory requirements.

3.1.3 The aircraft had no outstanding defects and was serviceable for the accident flight.

3.1.4 The aircraft was operating within its weight and centre of gravity limits.

3.1.5 The pilot held a valid KCAA Class 2 Medical Certificate which entitled him to act as the pilot-in-command of the accident flight.

3.1.6 The detachment of the left main landing gear wheel assembly was due to it coming into contact with a stone. The propeller strike occurred in the second segment of travel.

3.1.7 The aircraft veered off the runway to the left and subsequently ground looped, coming to a stop on its right side with the left wing facing up and the aircraft facing 90 degrees to the left of intended direction of travel. The total distance travelled was 202 metres.

3.2 Probable causes

The probable cause of the accident was the pilot's failure to maintain directional control of the aircraft leading to inadequate clearance with obstacles on the ground resulting in an accident.

3.3 Contributing Factors

3.3.1 Pilot's inadequate pre-flight preparation;

3.3.2 Condition of the makeshift runway.

4. SAFETY RECOMMENDATIONS

None

Martyn Lunani

CHIEF INVESTIGATOR OF ACCIDENTS

May 2023