SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10438								
Classification	Accident		**Date**	2 April 2024			**Time**	0515Z	
Type of Operation	Private (Part 91)								
Location									
Place of Departure	Groutville Airfield KwaZulu-Natal Province		Place of Intended Landing			New Tempe Airfield (FATP), Free State Province			
Place of Occurrence	On Runway 05 at Grootville Airfield in Ballito, KwaZulu-Natal Province								
GPS Co-ordinates	Latitude	29°24'36.5"S	Longitude	31°16'46.0" E			Elevation	235 ft	
Aircraft Information									
Registration	ZS-ZZZ								
Make; Model; S/N	Cirrus Design Corporation; SR22 (Serial Number: 4602)								
Damage to Aircraft	Destroyed			Total Aircraft Hours		663.2			
Pilot-in-command									
Licence Type	Private Pilot Licence (PPL)		Gender	Male			Age	55	
Licence Valid	Yes	Total Hours	1305.6	Total Hours on Type		1147.34			
Total Hours 30 Days	6.8		Total Flying on Type Past 90 Days	33.8					
People On-board	1+3	**Injuries** 0	**Fatalities**	0	**Other (on the ground)**	0			

What Happened

On 2 April 2024, a pilot and three passengers on-board a Cirrus SR22 aircraft with registration ZS-ZZZ took off on a private flight from Groutville Airfield in KwaZulu-Natal province to New Tempe Airfield (FATP) in the Free State province. Visual meteorological conditions (VMC) by day prevailed at the time of the flight which was conducted under the provisions of Part 91 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot reported that the aircraft was refuelled with 80 litres (l) of Avgas 100LL. According to the Pilot's Operating Handbook (POH), the fuel capacity of the aircraft is 318l with 8 hours endurance under normal operation. The pilot stated that he conducted a pre-flight inspection with no anomalies found. The aircraft was lined up on Runway 05 for take-off. The runway surface was rough and covered in grass which was overgrown. The aircraft generated normal power and accelerated on the runway, thereafter, the pilot gently pulled back on the elevator control to lift off the nose wheels. The aircraft took off at a speed of 70 knots indicated airspeed (KIAS) with the flaps set at 50%. According to the POH, *the take-off speed for Cirrus SR22 is 80 KIAS, with the flaps set at 50% during standard operating procedures; for short-field take-offs, the indicated airspeed (KIAS) should be 78 knots with the flaps set at 50%*.

The pilot reported that after take-off, the stall warning activated, and the aircraft stalled due to low-speed take-off. The pilot immediately pushed the control stick forward to lower the nose and gain speed, however, the aircraft's response was sluggish due to slow speed, this was followed by the drop of the right wing. The pilot tried to correct the anomaly without success, and thus, the right wing impacted the runway surface. The pilot lost control of the aircraft; it came to a stop facing east of the runway.

During the accident sequence, the nose landing gear collapsed, the right main landing gear separated, the engine mount separated, the propeller struck the ground, and the empennage

separated from the fuselage. The aircraft was destroyed; however, the pilot and the passengers were unharmed.

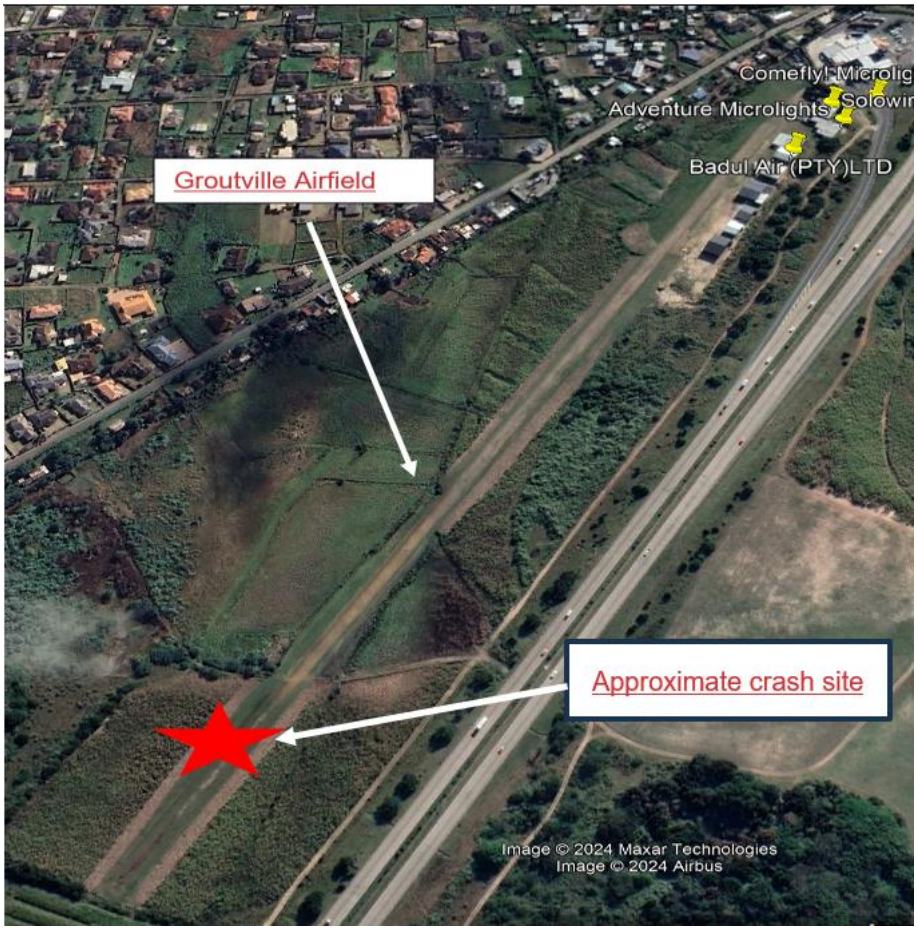


Figure 1: Aerial view of Groutville Airfield and the approximate area where the aircraft had stopped. (Source: Google Earth)

The airfield is privately owned. It comprises two grass-covered runways: Runway 05/23, which is 800 metres (m) long and 30m wide.

The pilot reported that the runway surface was rough and had overgrown grass. The operator who is also based at the same airfield and uses the same runway daily, sent the investigator the photo of the runway on the day of the accident and reported the following: "*the runway was impeccably maintained, ensuring a smooth path for the aircraft. The surface was flawlessly kept, and the grass on the runway was neatly trimmed to a height of 2 centimetres (cm). These measures ensured minimal obstruction to aircraft operations and met all safety standards and operational* requirements" (see Figure 2).

Figure 2: The Groutville runway surface. (Source: Operator)

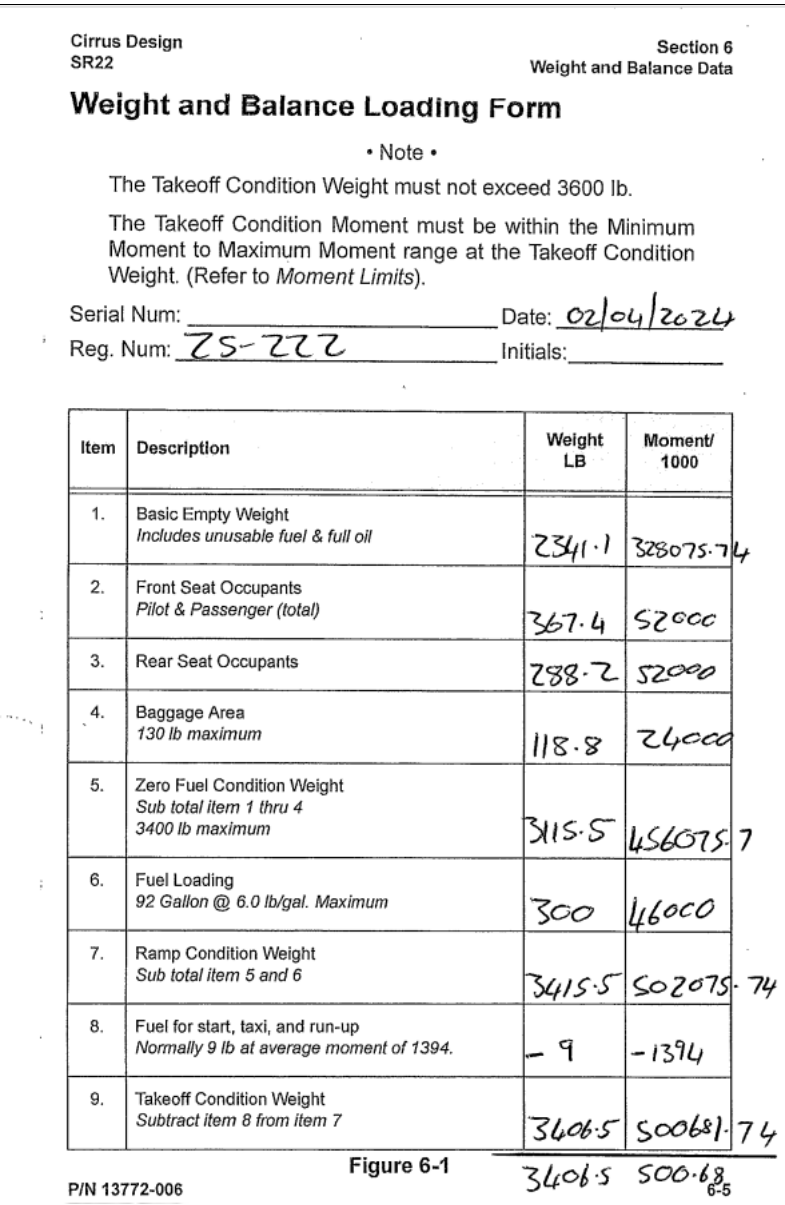
- The Cirrus Design SR22 states the following regarding the runway surface.

  Section 2 **Cirrus Design**
  Limitations **SR22**

  Runway Surface
  This airplane may be operated into and off any runway surface.

Figures 3 and 4: The aircraft as it came to rest after the accident. (Source: Pilot).

- The aircraft's weight and balance were checked and found to be within the prescribed limits.



Cirrus Design
SR22

Section 6
Weight and Balance Data

Weight and Balance Loading Form

• Note •

The Takeoff Condition Weight must not exceed 3600 lb.

The Takeoff Condition Moment must be within the Minimum Moment to Maximum Moment range at the Takeoff Condition Weight. (Refer to *Moment Limits*).

Serial Num: _____ Date: 02/04/2024

Reg. Num: 25-222 Initials: _____

Item	Description	Weight LB	Moment/ 1000
1.	Basic Empty Weight *Includes unusable fuel & full oil*	2341.1	328075.74
2.	Front Seat Occupants *Pilot & Passenger (total)*	367.4	52000
3.	Rear Seat Occupants	288.2	52000
4.	Baggage Area *130 lb maximum*	118.8	24000
5.	Zero Fuel Condition Weight *Sub total item 1 thru 4* *3400 lb maximum*	3315.5	456075.7
6.	Fuel Loading *92 Gallon @ 6.0 lb/gal. Maximum*	300	46000
7.	Ramp Condition Weight *Sub total item 5 and 6*	3415.5	502075.74
8.	Fuel for start, taxi, and run-up *Normally 9 lb at average moment of 1394.*	-9	-1394
9.	Takeoff Condition Weight *Subtract item 8 from item 7*	3406.5	500681.74

3406.5 500.68

Figure 6-1

P/N 13772-006

6-5

Figure 5: The weight and balance sheet. (Source: Operator)

- The Cirrus SR22 Pilot's Operating Handbook (POH) for Short Field Take-off, states the following:

  Short Field Take-off

  1. Flaps ……50%

  2. Brakes ……..HOLD

  3. Power Lever……..……...FULL FORWARD

  4. Mixture ……SET

  5. Engine parameters……CHECK

  6. Brakes……RELEASE (Steer with Rudder Only)

  7. Elevator Control……..ROTATE Smoothly at 73 KIAS

  8. Airspeed at Obstacle……84 KIAS

- The weather information in the table below was obtained from the South African Weather Service on 2 April 2024 at 0515Z, recorded at King Shaka International Airport (FALE) in KwaZulu-Natal province. FALE is located 35 kilometres (km) from Groutville Airfield. According to SAWS, FALE is the closest weather station to Groutville Airfield.

Wind Direction	360°	Wind Speed	04kts	Visibility	9999m
Temperature	20°C	Cloud Cover	Nil	Cloud Base	Nil
Dew Point	19°C	QNH	1015hPa		

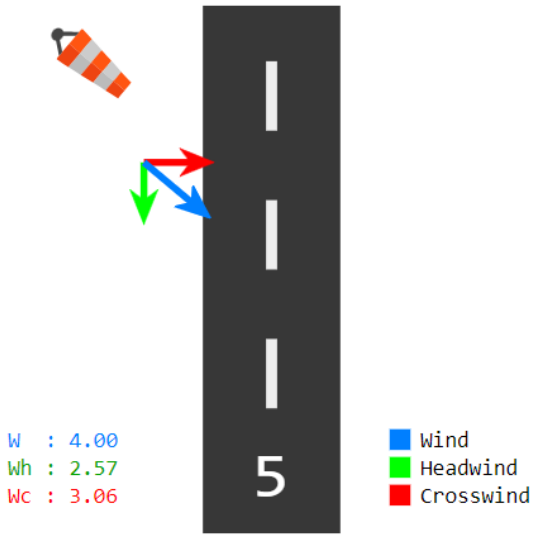


Figure 6: The crosswind component as per the weather report. (Source: https://e6bx.com)

- The report (above) indicates a constant wind speed and direction on the surface, this indicates absence of low-level wind shear turbulence.
- The crosswind component (which refers to the maximum crosswind velocity that an aircraft can handle during take-off and landing) for the Cirrus SR22 is 21 knots (kts).

The Federal Aviation Administration (FAA) provides the following definition for “loss of control”.

> *A loss of control (LOC) accident involves an unintended departure of an aircraft from a controlled flight. LOC can happen when the aircraft enters a flight regime that is outside its normal flight envelope and quickly develops into a stall or spin. It can introduce an element of surprise for the pilot.*

Findings

Pilot

1. The pilot was initially issued a Private Pilot Licence (PPL) on 22 November 2012. His last validation was conducted on 24 August 2022 with an expiry date of 31 August 2024. The aircraft was endorsed on the pilot’s licence. A Class 2 medical certificate was issued to the pilot on 17 August 2023 with an expiry date of 31 August 2024.

Approved Person

2. The approved person (AP) who certified the last MPI was appropriately certificated to conduct maintenance on the aircraft. The maintenance records indicated that the aircraft was maintained in accordance with (IAW) the regulations and approved procedures. Therefore, maintenance was not a factor in this accident.

Aircraft

3. The aircraft's Certificate of Registration (C of R) was issued to the current owner on 7 June 2019. The Certificate of Airworthiness (C of A) was initially issued on 29 July 2019. The latest C of A was reissued on 12 July 2023 with an expiry date of 31 July 2024.

4. The last mandatory periodic inspection (MPI) on the aircraft was certified on 26 February 2024 at 649.0 airframe hours. At the time of the accident, the aircraft had a total of 663.2 airframe hours. The aircraft accrued14.2 hours since the last MPI.

5. The aircraft was issued a Certificate of Release to Service (CRS) on 26 February 2024 at 649.0 airframe hours with an expiry date of 25 February 2025 or at 749.0 airframe hours, whichever occurs first. There were no defects recorded in the flight folio at the time of the accident.

6. The aircraft was in an airworthy condition before the flight.

7. It was determined that the weather conditions did not contribute to the occurrence of this accident.

8. Despite the pilot's statement regarding the unevenness of the runway and overgrown grass, it was determined that the condition of the runway (Figure 2) did not contribute to this accident and the aircraft can be operated in any condition of the runway. During the initial climb, the pilot stalled the aircraft and lost control because of the increased angle-of-attack which resulted in reduced rate of climb and speed.

Probable Cause

The pilot stalled the aircraft during take-off due to slow speed and incorrect take-off technique.

Contributing Factors

Excessive angle-of-attack during climb.

Safety Action(s)

None.

Safety Message and Recommendation

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 desktop inquiries to bring awareness of potential safety issues to the industry in respect of this occurrence, as well as 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 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