

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10404						
Classification	Accident	Date	22 December 2023		Time	0830Z	
Type of Operation	Private (Part 94)						
Location							
Place of Departure	Farm Elands near Marble Hall, Limpopo Province		Place of Intended Landing		Farm Yzervark near Bapsfontein, Gauteng Province		
Place of Occurrence	Private Farm near Bapsfontein, Gauteng Province						
GPS Co-ordinates	Latitude	26°02'59.55" S	Longitude	028°33'05.36" E	Elevation	5 203 ft	
Aircraft Information							
Registration	ZU-EZA						
Make; Model; S/N	Sky Ranger (Serial Number: 831)						
Damage to Aircraft	Substantial			Total Aircraft Hours	698.5		
Pilot-in-command							
Licence Type	National Pilot Licence (NPL)		Gender	Male		Age	79
Licence Valid	Yes	Total Hours	1128		Total Hours on Type	52.2	
Total Hours Past 30 Days	8		Total Flying Hours on Type Past 90 Days		28		
People On-board	1 + 0	Injuries	0	Fatalities	0	Other (on ground)	0
What Happened							
<p>On Friday morning, 22 December 2023, a pilot on-board a Sky Ranger aircraft with registration ZU-EZA took off on a private flight from Farm Elands to Farm Yzervark. Visual meteorological conditions (VMC) by day prevailed at the time of the flight which was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>The pilot reported that the aircraft departed Farm Elands near Marble Hall to Farm Yzervark near Bapsfontein; the flight was uneventful. During final approach for landing on Runway 05 at Farm Yzervark, the aircraft experienced a wind shear and the airspeed increased from 60 knots to 90 knots as it was pulled towards the centre of the windshear. Due to the aircraft being blown in all directions, it became difficult for the pilot to control it and he landed the aircraft deep. As a result, the aircraft overshot the runway. The aircraft came to a stop in a ditch beyond the runway. The pilot turned the master switch off and disembarked from the aircraft without assistance; he was uninjured. The aircraft sustained substantial damage to the nose gear, propeller and both wings leading edges.</p> <p>The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 26°02'59.55" South 028°33'05.36" East, at an elevation of 5203 feet (ft).</p>							



Figure 1: Aerial view of the accident site. (Source: Google Earth)



Figure 2: The aircraft as it came to rest after the accident. (Source: Pilot)

The weather information below was obtained from the pilot questionnaire:

Wind Direction	180°	Wind Speed	4kts	Visibility	10km
Temperature	16°C	Cloud Cover	Scattered cloud	Cloud Base	1500ft
Dew Point	Unknown	QNH	Unknown		

Post-accident:

The pilot stated that the aircraft was blown in all directions, and it became difficult to control it; he also thought that the control cable had broken. After landing and checking the aircraft, he found no anomalies with the aircraft besides the damage sustained during the accident.

Windshear (Source: <http://www.bom.gov.au/aviation/data/education/wind-shear.pdf>)

Wind shear is defined as a wind direction and/or speed change over a vertical or horizontal distance. It is significant when it causes changes to an aircraft's headwind or tailwind such that the aircraft is abruptly displaced from its intended flight path and substantial control action is required to correct it. Although wind shear may be present at all levels of the atmosphere, its occurrence in the lower levels is of particular importance to aircraft taking-off and landing. During the climb-out and approach phases of flight, aircraft airspeed and height are near critical values, rendering the aircraft especially susceptible to the adverse effects of wind shear. The response of aircraft to wind shear is extremely complex and depends on many factors including the type of aircraft, the phase of flight, the scale on which the wind shear operates relative to the size of the aircraft, and the intensity and duration of the wind shear encountered. It should be noted that wind shear is always present in turbulent air, but windshear can occur without turbulence being present.

Wind shear is a common phenomenon within the atmosphere, occurring at any level where adjacent layers or columns of air have different velocities. It can produce sudden changes in aircraft altitude and speed.

Description (Source: <https://skybrary.aero/articles/low-level-wind-shear>)

*Low Level Turbulence, which may be associated with a frontal surface, with thunderstorms or convective clouds, with microbursts, or with the surrounding terrain, is particularly hazardous to aircraft departing or arriving at an aerodrome. **Wind shear is usually associated with one of the following weather phenomena:***

- *Frontal surfaces*
- *Jet streams*
- *Thunderstorms or convective clouds especially cumulonimbus or towering cumulus*
- *Mountain Waves*
- *Microbursts*

The pilot approached for landing at a private airstrip without following the unmanned joining procedures. According to the pilot's statement, the aircraft experienced a sudden increase in speed from 60 knots to 90 knots during final approach and it became difficult to control; this resulted in an unstable approach and the subsequent deep landing which led to the aircraft overshooting the runway.

Findings

1. The pilot was initially issued a National Pilot Licence (NPL) by the South African Civil Aviation Authority (SACAA) on 6 January 2009. The latest NPL was reissued on 13 November 2023 with an expiry date of 12 November 2025. The pilot had flown a total of 1128 hours of which 52.2 hours were on the aircraft type.
2. The pilot had the aircraft type endorsed on his licence. The pilot had a valid Class 4 aviation medical certificate that was issued on 7 February 2023 with an expiry date of 7 February 2025.
3. The aircraft had a Certificate of Registration (C of R) that was issued on 13 January 2022 to the current owner. The aircraft's Authority to Fly (ATF) was issued on 15 February 2023 with an expiry date of 30 November 2023. The ATF was invalid at the time of the accident.
4. The aircraft was issued a Certificate of Release to Service (CRS) on 15 December 2023 at 707.3 hours with an expiry date of 30 November 2024 or at 807.3 hours, whichever occurs first. There were no defects recorded in the flight folio at the time of the accident flight.
5. Given the fact that the cloud base was at 1500 ft and there was no weather phenomenon associated with the wind shear, it is unlikely that the aircraft experienced a wind shear during landing, thus, the weather had no effect to this accident.
6. It is likely that the aircraft's airspeed was too high on approach and landing, which resulted in the aircraft landing deep and overshooting the runway before it came to a stop in a ditch beyond the runway.

Probable Cause

It is likely that the aircraft's airspeed was too high on approach, and during the landing phase, the aircraft landed deep and overshoot the runway before it came to a stop in a ditch beyond the runway.

Contributing Factor

The aircraft landed at a high speed.

Safety Action(s)

None.

Safety Message
In the interest of safety, pilots are advised to be vigilant during the critical phases of flight such as take-offs and landings.
About this Report
<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>
<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>
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