SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10239						
Classification	Accident	**Date**	3 December 2022		**Time**	0900Z	
Type of Operation	Skydiving (Part 96)						
Location							
Place of Departure	Skydive the Ranch Airfield, Mpumalanga Province	Place of Intended Landing	Wonderboom Aerodrome (FAWB), Gauteng Province				
Place of Occurrence	Skydive the Ranch Airfield, near Delmas Mpumalanga Province						
GPS Co-ordinates	Latitude	26° 02' 44.31" S	Longitude	028° 48' 18.39" E	Elevation	5015ft	
Aircraft Information							
Registration	ZS-WZP						
Make; Model; S/N	Atlas Angel AL-60C4M KUDU (Serial Number: 967)						
Damage to Aircraft	Substantial	Total Aircraft Hours	6443.1				
Pilot-in-command							
Licence Type	Private Pilot Licence (PPL)	Gender	Male	Age	40		
Licence Valid	Yes	Total Hours	352	Total Hours on Type	4.8		
Total Hours 30 Days	11.5	Total Flying on Type Past 90 Days	4.8				
People On-board	1+9	**Injuries**	0	**Fatalities**	0	**Other (on ground)**	0

What Happened

On 3 December 2022 at 0900Z, a pilot and nine (9) skydivers on-board an Atlas Angel AL-60C4M aircraft with registration ZS-WZP took off on a sky diving flight from Skydive the Ranch Airfield in Mpumalanga province. The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 96 of the Civil Aviation Regulations (CAR) 2011 as amended.

The pilot stated that he conducted a pre-flight inspection, and no anomalies were detected. He further reported that during the take-off roll and shortly before rotation, he lost directional control and the aircraft's left horizontal stabiliser collided with a fence post. The pilot decided to continue to rotate and climb to 11 000 feet above ground level (AGL) at a rate of 1000 feet per minute.

Figure 1: A file picture of the aircraft. (Source: https://www.planespotters.net/photo/605043/zs-wzp-atlas-angel-lockheed-atlas-al-60c-4m-tp-angel-l-402

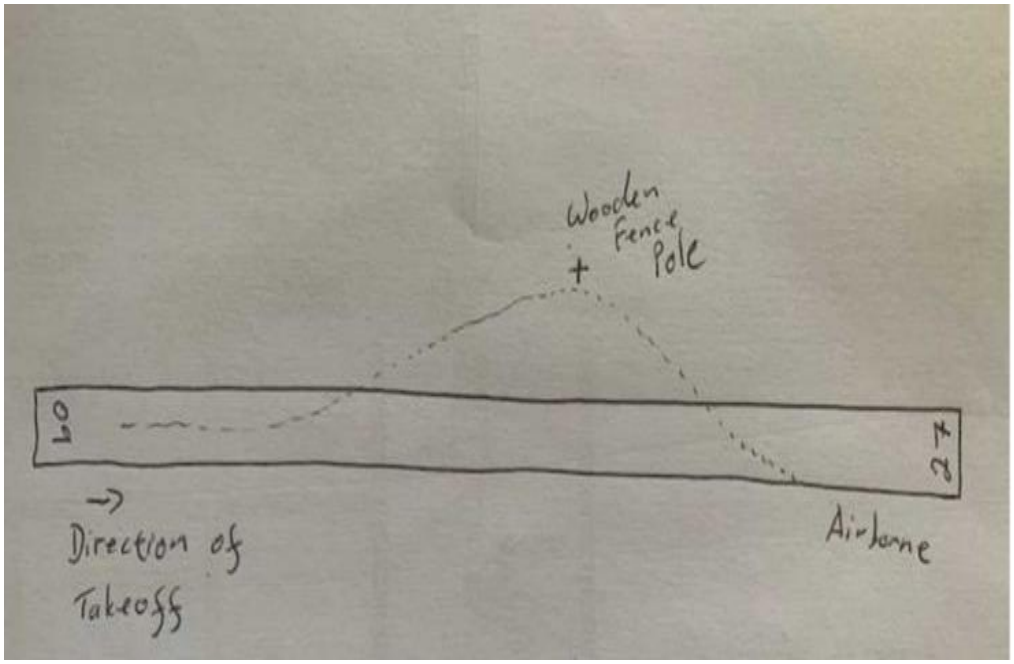

Figure 2: A pilot's sketch of the take-off path. (Source: Pilot)

He then dropped off the skydivers and, thereafter, flew to Wonderboom Airport (FAWB) in Gauteng province to have the emergency services and the aircraft maintenance organisation (AMO) check the elevator as it was damaged during the take-off roll. The pilot contacted FAWB air traffic control officer (ATCO) during the flight to inform them that he was en route to the airport (FAWB) because he had collided with a fence pole during take-off and wanted the aircraft checked, as well as requested the service of the fire and rescue personnel when he lands. The ATCO contacted the fire and rescue services as per the pilot's request. The aircraft landed safely on Runway 29 at 1000Z and continued to taxi to the AMO's hangar. The aircraft sustained substantial damage to the left horizontal stabiliser. No person was injured during this accident.

Post-accident

1. During the interview after the accident, the pilot stated that the weather temperature was high (hot weather) with the crosswind component during take-off. He further stated that he may have over corrected for the crosswind and that there could have been a gust of wind as well. The pilot confirmed that there was no anomaly with the aircraft, its performance or the runway surface. The accident flight was the pilot's fifth take-off of the day from the same airfield. He stated that he decided to continue flying with a damaged aircraft as he felt it was the safest option.

Figure 3: Skydive the Ranch Airfield layout. (Source: Google Earth)

Figure 4: Rearview of the damaged horizontal stabiliser. (Source: Pilot)

Figure 5: Side view of the damaged left horizontal stabiliser. (Source: Pilot)

2. Aircraft description: http://www.skydiveparys.co.za/about-skydiving-south-africa/aircraft/lockheed-atlas-angel/

The AL-60C version was built under license by Atlas Aircraft Corporation in South Africa. This aircraft was designated the Atlas C4M and known as the Kudu. Over 40 aircraft were built and served the South African Air Force between 1974 and 1991. A number of C4M Kudu aircraft are still flying privately and have proven well in the role of skydive release aircraft. This design known as the Atlas Angel or Turbine Kudu it can take 8 to 9 pax to an altitude of 11 000ft AGL in 18-20 minutes.

3. Weather information

The weather information below was recorded at Skydive the Ranch Airfield on 3 December 2022 at 0850Z as per the pilot questionnaire.

Wind Direction	360°	Wind Speed	calm	Visibility	10km
Temperature	26°C	Cloud Cover	Nil	Cloud Base	CAVOK
Dew Point	4°C	QNH	Unknown		

The weather information below was obtained from the Meteorological Aerodrome Report (METAR) that was issued by the South African Weather Service (SAWS), recorded at Witbank Airfield (FAWI) weather station on 3 December 2022 at 0900Z. FAWI is 57 kilometres north-west of Skydive the Ranch Airfield.

Wind Direction	010°	Wind Speed	5knots	Visibility	10km
Temperature	26°C	Cloud Cover	Nil	Cloud Base	CAVOK
Dew Point	12°C	QNH	1017		

4. Take-off procedure. (Source: C4m Atlas Angel Aircraft: Pilot's Operating Handbook)

Take-off General

1. *Regardless of take-off mass, power should be applied gradually and limited to Torque = 105 psi until a steady climb attitude is established.*
2. *There is a tendency for the aircraft to swing to the left, most pronounced at the start of the take-off run. This is readily controllable by keeping the locked tailwheel on the ground until 25 kts is reached, above which adequate rudder control is available.*
3. *On rough ground the tailwheel should be raised slightly during the take-off run above 25 kts to avoid bouncing.*
4. *After becoming airborne, accelerate to climbing speed as soon as possible.*

Overload take-off (over 2040 kg)

1. *TAILWHEEL UNLOCK control ..... Check locked.*
2. *FLAP control ..... Select 66%*
3. *Horizontal stabiliser ..... Set to 1 degree nose down.*
4. *Wheel brakes ..... Release*
5. *POWER LEVER ..... Open smoothly to take-off power*
6. *At approximately 25 kts IAS, raise the tail and allow the aircraft to accelerate to the appropriate take-off speed given in Section 5, FIG 5*
7. *At 70 kts IAS, raise the flaps to 33% and at 80 kts IAS, raise the flaps fully.*
8. *Accelerate to the recommended climb speed as shown in Section 5, FIG 5-7, after clearing initial obstacles*

5. According to the Pilot's Operating Handbook (POH), the maximum take-off weight (MTOW) is 2600 kilograms (kg). The aircraft's empty weight is 1379 kg. On-board the aircraft, the weights were as follows: pilot – 90 kg, nine skydivers – 786 kg, fuel – 94 kg, total take-off weight – 2343 kg. The weight was within the 2600 kg limit. The runway dimension at Skydive the Ranch Airfield is 950m x 20m. The distance needed for take-off with 2600 kg on a hard surface runway is 505 metres (m) at an elevation of 5015ft (1524m).

Findings

1. The pilot was initially issued a Private Pilot Licence (PPL) on 19 November 1999. The pilot was reissued the PPL on 29 October 2022 with an expiry date of 30 November 2024.

2. The pilot was issued a Class 2 medical certificate on 23 January 2018 with an expiry date of 31 January 2023 with no restrictions.

3. The aircraft's last annual inspection was carried out on 10 June 2022 at 1797.7 airframe hours, after which a Certificate of Release to Service (CRS) was issued with an expiry date of 10 June 2023 or at 1897.7 hours, whichever comes first.

4. The Authority to Fly (ATF) was issued on 28 June 2022 with an expiry date of 31 July 2023.

5. The Certificate of Registration (C of R) was issued to the present owner on 18 February 2021.

6. The pilot lost directional control during the take-off roll and, just before rotation/take-off, the aircraft's left stabiliser impacted a fence post.

7. The pilot stated that there was a crosswind at the time, and that the weather was hot during take-off. According to the pilot questionnaire and the official weather report from SAWS, the wind was calm.

8. The POH states that there is a tendency for the aircraft to swing to the left which is most pronounced at the start of the take-off run. The pilot stated that it is possible that he may have over corrected for the crosswind and that there could have been a gust of wind at the same time, resulting in loss of directional control.

Probable Cause(s)

The pilot lost directional control during take-off and the aircraft impacted a fence post with the left horizontal stabiliser shortly before rotation.

Contributing Factor

None.

Safety Action(s)

None.

Safety Message and/or Safety Recommendation/s

Pilots are encouraged to abort take-off when there is loss of directional control or after colliding with objects as it is unsafe to continue flying without assessing damage after an occurrence.

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

This report is issued by:
Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa