Preliminary Accident Report

Version number: 1.1
Date 10 December 2024

By Ria Moothilal on behalf of SAHPA / SACAA

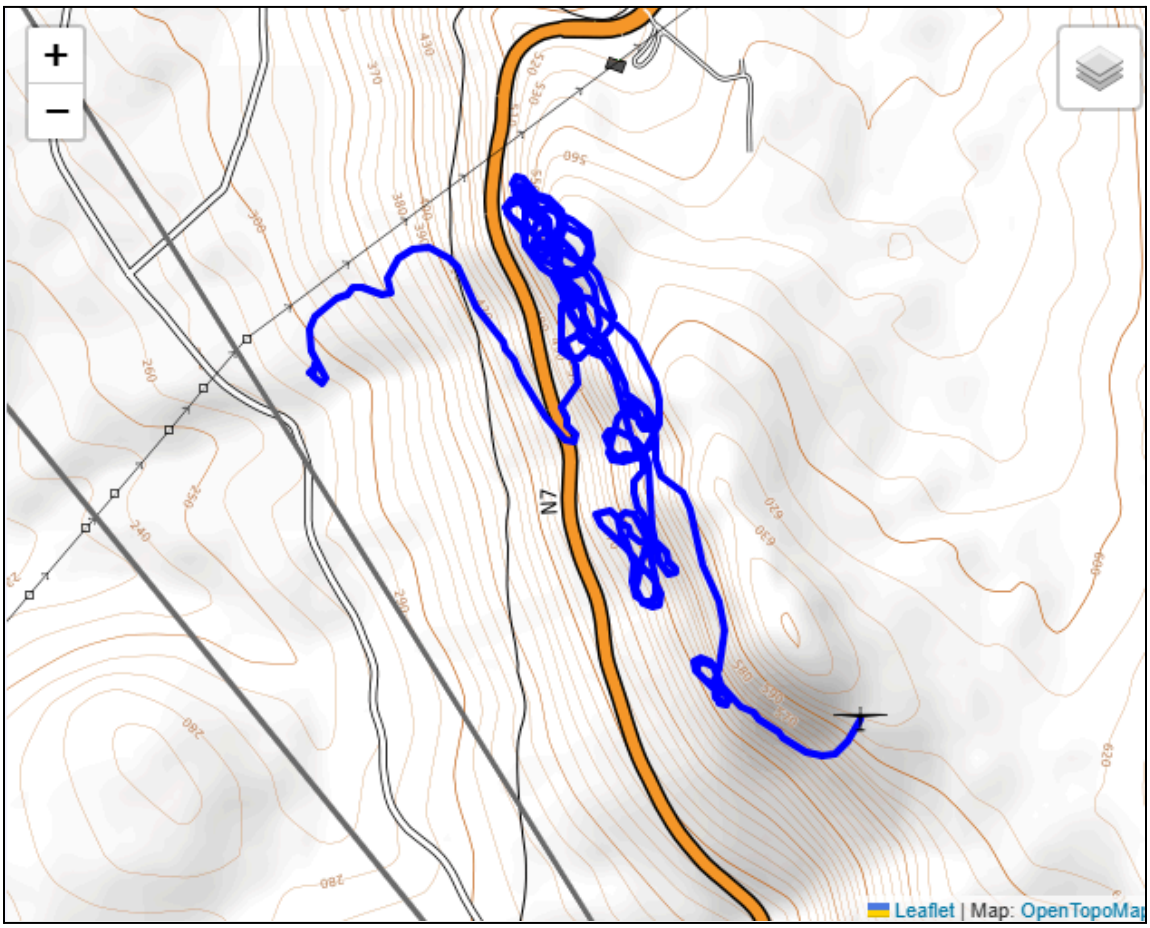


Figure 1: Solo paraglider flight resulting in a fatal accident on the west side of Piekinierskloof Pass (N7) near the town of Eendekuil in the Western Cape

Description:

On Friday the 22nd of March 2024 at approximately 12h56 (local time), a paragliding pilot had a fatal accident. The pilot was performing a solo recreational cross-country flight as part of a friendly event hosted by the local flying club. The accident occurred on a farmer's field on the lower western slope of the Piekinierskloof Pass (N7) near Eendekuil. There were multiple witnesses.

INTRODUCTION

Reference Number: SAHPA/128/25/03/2024

Manufacturer: Bruce Goldsmith Design (BGD)

Model: Base

Nationality: South African

Registration Marks: NA

Place: 32°38'10.4"S 18°56'24.4"E

Date: Fri 22 Mar 2024

Time: 12h56 (local time)

Purpose of the Investigation:

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, this report was compiled to ***promote aviation safety and reduce the risk*** *of aviation accidents or incidents and* ***not apportion blame or liability****.*

All times given in this report are South African Standard Time.

Investigation Process:

On the 26th of March 2024, the SAHPA Committee appointed the author of this report as the Lead Investigator for this accident. Various supporting documents and evidence were made available for the investigation. In addition, additional information from other external sources was sourced. The available data is analysed in this document.

Notes:
1. Whenever the following words are mentioned in this report, they shall mean the following:

- *Accident — this investigated accident*
- *Aircraft — the paragliding craft involved in this accident*
- *Investigation — the investigation into the circumstances of this accident*
- *Pilot — the pilot involved in this accident*
- *Report — this accident report*

2. Photos and figures used in this report were taken from different sources and may have been adjusted from the original to improve the clarity of the report. Modifications to images used in this report were limited to cropping, magnification, file compression; enhancement of colour, brightness, and contrast; or addition of text boxes, arrows, or lines.

Disclaimers:

- *This report is produced without prejudice to the rights of SAHPA, which are reserved.*
- *The author of this report was a participant in the event in which this accident occurred and played a key role in setting the task for participants to fly on the day.*

Table of Contents

ABBREVIATION	DESCRIPTION
‘	Coordinates minutes (distance)
"	Coordinates seconds (distance)
°	Degrees
°C	Degrees Celsius
AIID	Accident and Incident Investigations Division
ASL	Above Sea Level
CAR	Civil Aviation Regulations
EMS	Emergency Medical Service
GPS	Global Positioning System
IGC	File format specified by the International Gliding Commission
kph	Kilometres per hour
m	Metres
NPL	National Pilots License
RASP	Regional Atmospheric Soaring Prediction (www.rasp.org.za)
SACAA	South African Civil Aviation Authority
SAHPA	South African Hang-gliding and Paragliding Association
SIV	Safety Manouvers Training in paragliding

1. Factual Information

1.1. History of Flight

1.1.1. On the 22nd of March 2024, a solo paragliding pilot had a fatal accident on a farmer's field near the town of Eindekuil. The recreational cross-country flight started at the Kardoesie (southwest) take-off site - approximately 1.5km from the accident scene.

1.1.2. The pilot was participating in a recreational event hosted by the local Glen Club paragliding club. The event, called the Glen Club Challenge, involved participants flying tasks. The goal was to introduce newer pilots to task flying in a low-pressure and friendly environment.

1.1.3. At least 20 pilots were flying at the same time, and 20 tracklogs from other pilots in the air, as well as the pilot, were available for this analysis. It is quite likely that some participants did not submit tracklogs for the day, hence the minimum of 20.

1.1.4. According to the available tracklog, the accident took place at 12h56 (local time)

1.1.5. Five witness statements reported by other paragliding pilots were reported to SAHPA and are available for this analysis.

1.1.6. Several pilots had landed and were in the vicinity of the accident when it happened.

1.1.7. The first-aid response included efforts of nearby paragliding pilots, a medical doctor (a guest at the event) and two paramedics who were part of the event.

1.1.8. The pilot was found with a puncture wound to the neck and severe blood loss

1.1.9. CPR was administered for approximately 30 minutes before the pilot was pronounced deceased at 13h32.

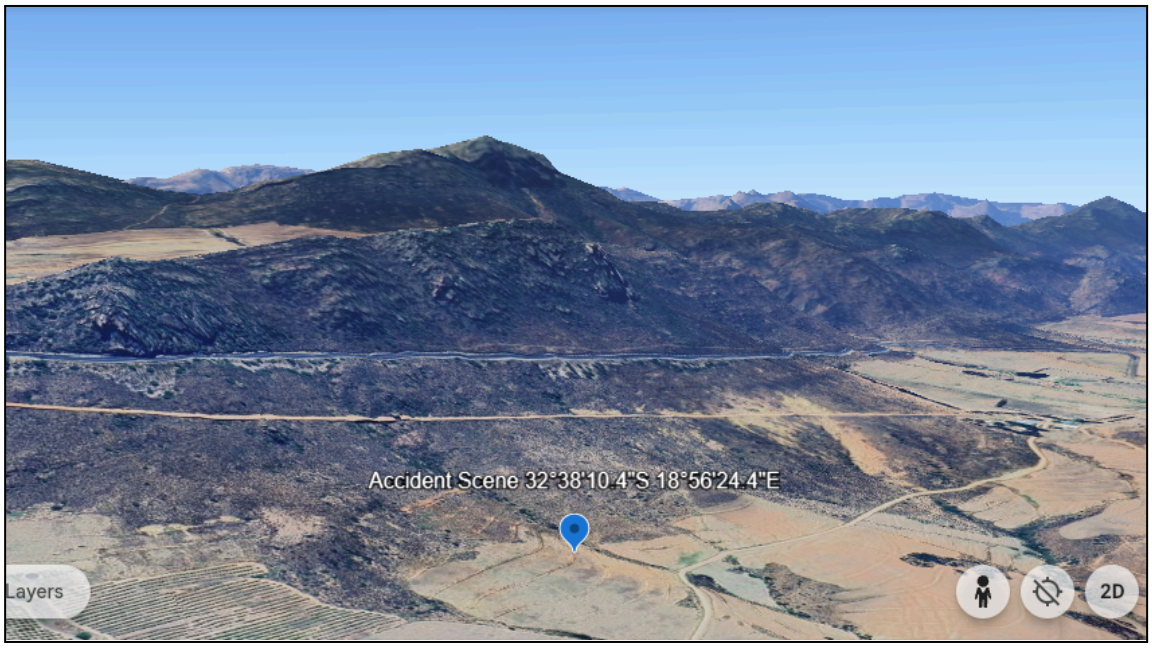


Figure 2: Google Earth snapshot showing the location of the accident

1.2. Injuries to Persons

1.2.1. The pilot was the sole life on board the paraglider.

Injuries	Pilot	Crew	Passengers	Total On-board
Fatal	1	-	-	1
Serious	-	-	-	-
Minor	-	-	-	-
None	-	-	-	-
Total	**1**	**-**	**-**	**1**

1.2.2. The injuries were fatal

1.3. Damage to Aircraft

1.3.1. The pilot's equipment was inspected by a service centre appointed by SAHPA after the accident.

1.3.2. There are no reports of damage to the equipment from the accident

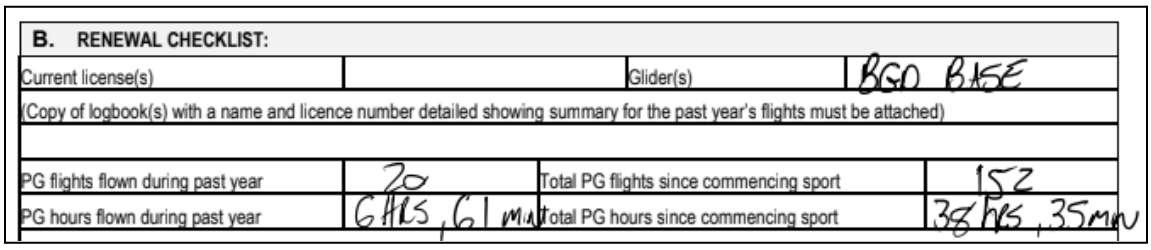
1.3.3. Witness statements indicate that the attending persons cut the harness straps to perform first aid.

1.4. Personnel Information

1.4.1. The pilot was a South African male aged 39 years old.

1.4.2. Licenses held: NPL for Paragliding - Basic License.

1.4.3. Experience: According to the information attained from the pilot's last license renewal (13 November 2023) and his electronic logbook, which is available from his flight instrument (FlySkyHy iOs mobile application), the pilot had 158 flights and approximately 40 hours of airtime.



B. RENEWAL CHECKLIST:			
Current license(s)		Glider(s)	BGO BASE
(Copy of logbook(s) with a name and licence number detailed showing summary for the past year's flights must be attached)			
PG flights flown during past year	20	Total PG flights since commencing sport	152
PG hours flown during past year	6 HRS, 61 MIN	Total PG hours since commencing sport	38 HRS, 35 MIN

Figure 3: Snapshot of pilots' flying stats as per the last license renewal on 13 November 2023

1.4.4. The pilot's electronic logbook with recent flight logging was available for this investigation. This logbook contains a history of 58 flights starting from the 13th of April 2021 up until the

last flight on the date of the accident. The total airtime logged over this period is 15.2 hours. This is a period of slightly over 3 years.

1.4.5. The pilot's electronic logbook shows a relatively low number of flights per month with some months not flying at all. It also shows that he changed from a Swing Discus (EN A) glider to a BGD Base (EN B) in September 2022

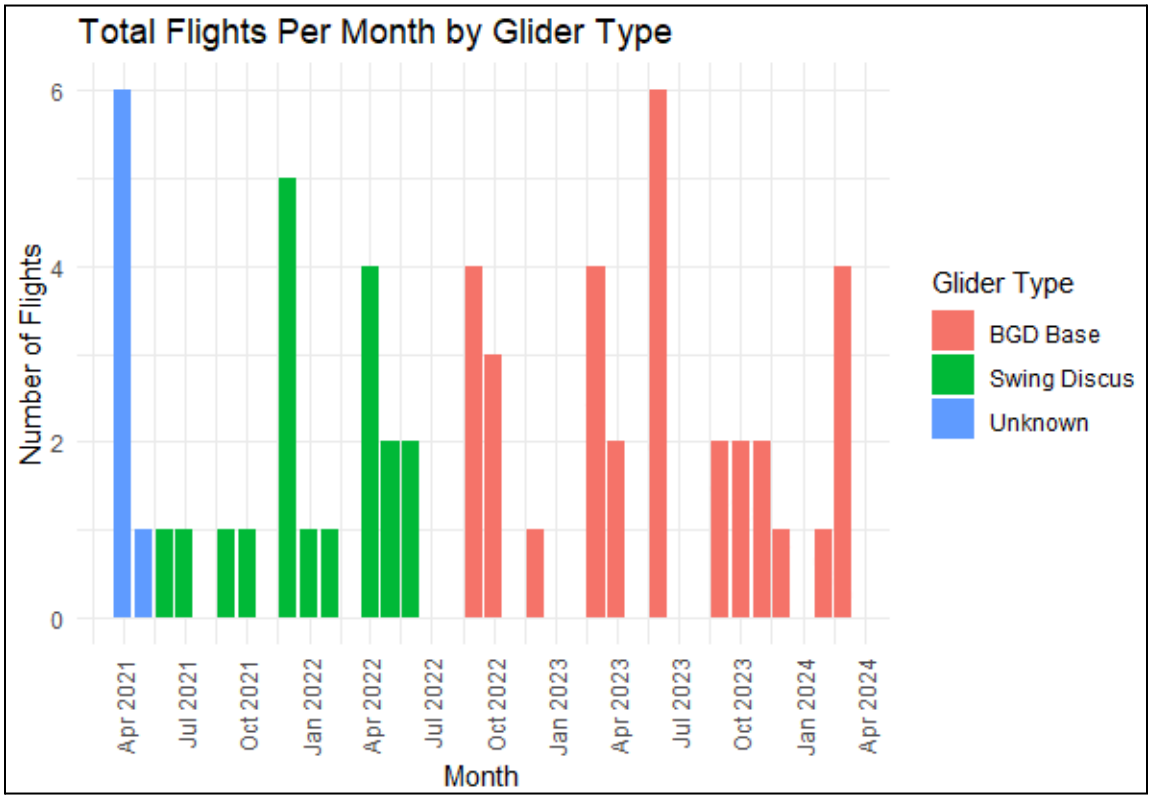


Figure 4: Monthly flights over time by glider type

1.4.6. From the available electronic logbook, the pilot often flew less than one hour per month

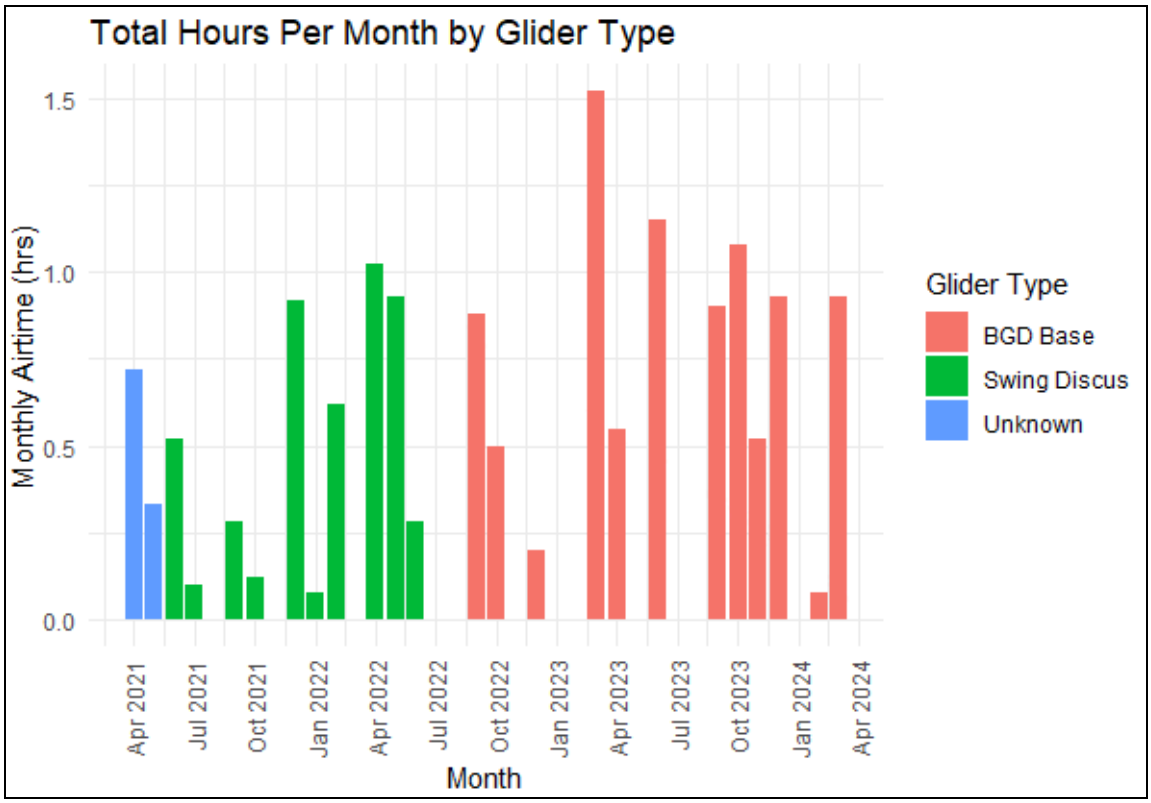


Figure 5: Monthly hours over time by glider type

1.4.7. The majority of the pilots' flying experience in the previous 3 years was at inland mountain sites

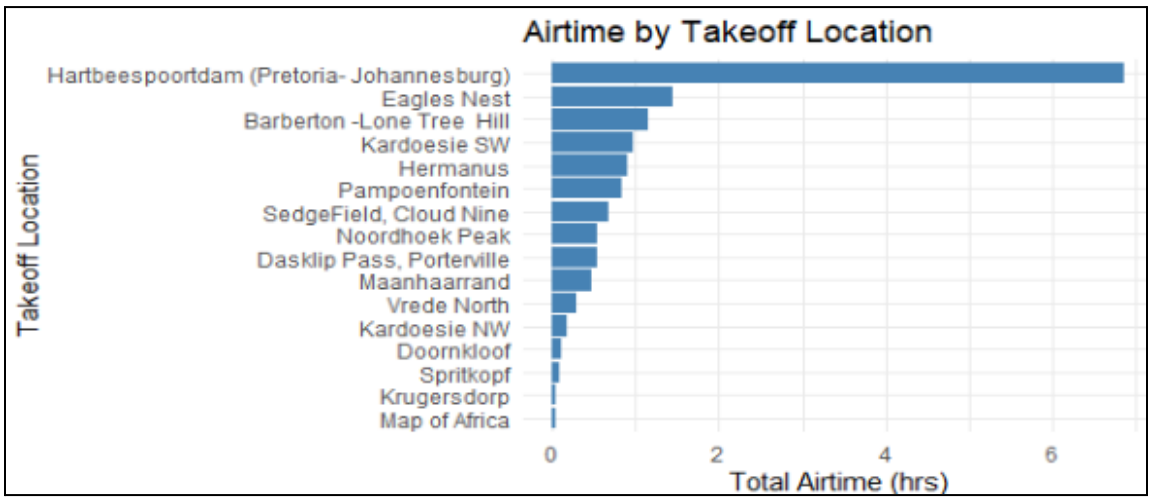


Figure 6: Takeoff Site Experience

1.4.8. The majority of the pilot's flights started in the middle of the day i.e. peak thermal activity

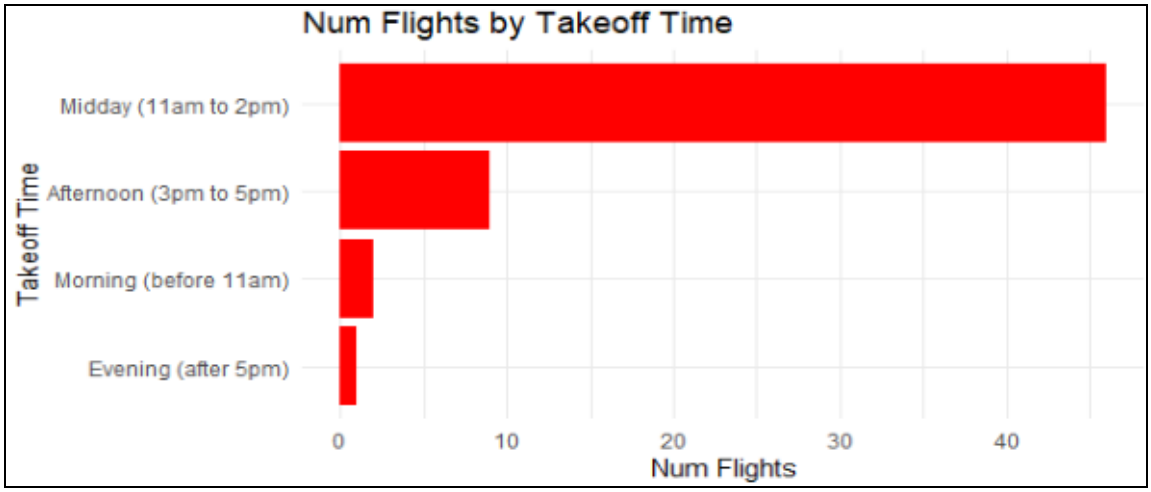


Figure 7: Take off time of day analysis

1.4.9. The majority of the pilot's flights were relatively short. In the past 3 years, only 3 flights were longer than 40 minutes with the maximum duration on record being a single flight of 56 minutes.

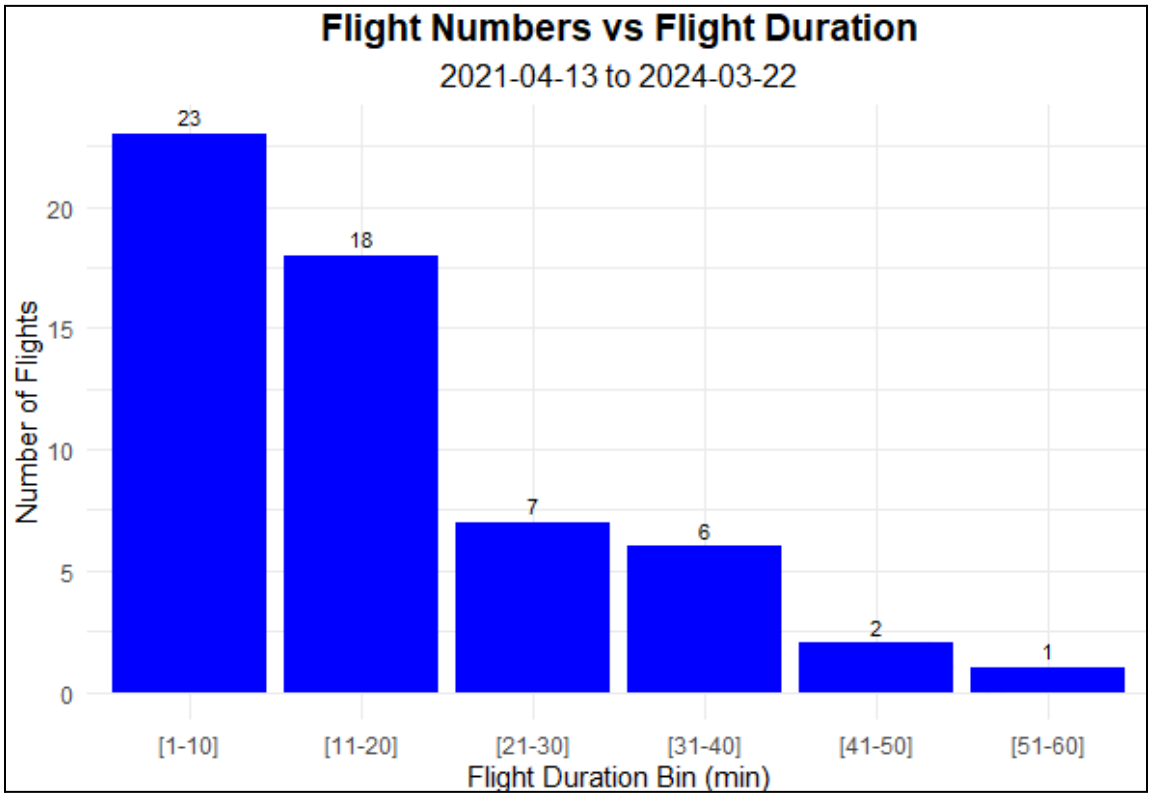


Figure 8: Duration of flight analysis

1.4.10. The majority of the pilot's flights in the past 3 years were flights that were relatively short in distance from takeoff (xc distance) with a maximum of 12km on record. 75% of flight distances in the last 3 were less than 1.7km from takeoff. Height gains above takeoff are also relatively low compared to that achievable on a paraglider. 75% of flights showed height gains of no more than 140m above takeoff altitude, and 50% of flights showed height gains less than 20m above takeoff altitude.

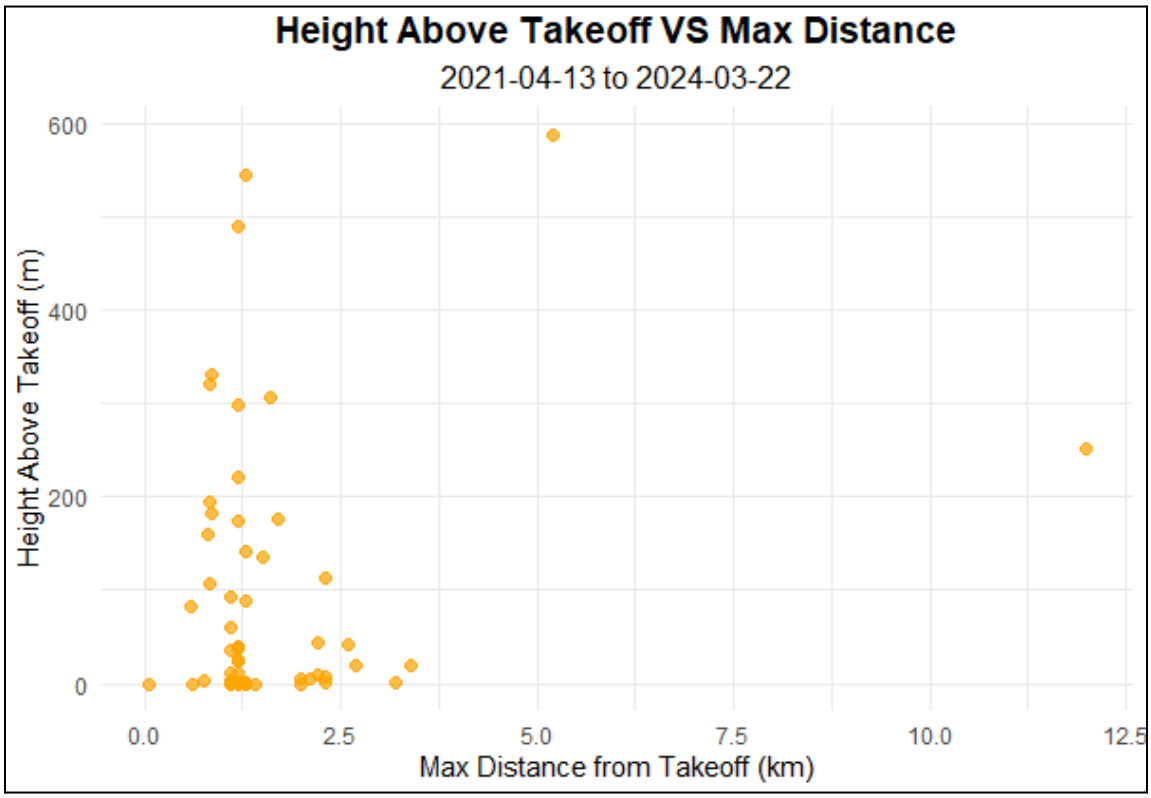


Figure 9: Flight characteristics analysis

1.5. Aircraft Information

1.5.1. Glider:

1.5.1.1. The paragliding wing is BGD Base size ML. Date of manufacture 17 August 2015. The total hours of usage on this wing are unknown. Serial number BG0-Q31D-124. The EN Certification is EN B

1.5.1.2. Manufacturer Description: According to the user manual for this wing, "*The BASE is an entry-level paraglider suitable for intermediate pilots offering a high level of passive safety combined with speed and good performance…*" as well as "*Your BASE is an **advanced, stable glider** that promises you many hours of safe and enjoyable flying, provided you treat it with care and always keep a **respect for the potential dangers of aviation**.*" - sourced from the BGD Base Manual available on the manufacturer's website - Version 3.5 April 2018

Figure 10: Sample photo sourced from the manufacturer's manual

1.5.1.3. Specifications:

	S	M	ML	L	
Linear scaling factor	0.95	1	1.025	1.05	
Projected area	18.72	20.74	21.79	22.87	m^2
Flat area	22.56	25.00	26.27	27.56	m^2
Glider weight	4.8	5.3	5.6	5.8	kg
Total line length	221	245	257	270	m
Height	7.1	7.24	7.4	7.8	m
Number of main lines	3/4/3	3/4/3	3/4/3	3/4/3	A/B/C
Cells	80/46/90	80/46/90	80/46/90	80/46/90	
Flat aspect ratio	5.68	5.68	5.68	5.68	
Projected aspect ratio	4.09	4.09	4.09	4.09	
Root chord	2.48	2.48	2.48	2.48	m
Flat span	11.24	11.83	12.13	12.42	m
Projected span	8.71	9.17	9.40	9.63	m
In-flight weight range	60-80	75-95	85-105	100-120	kg
Trim speed	39	39	39	39	km/h
Top speed	55	55	55	55	km/h
Min sink	1	1	1	1	m/s
Best glide	10	10	10	10	
Certification	EN+LTF:B	EN+LTF:B	EN+LTF:B	EN+LTF:B	

Table 2: Specifications for the paragliding wing in use

1.5.2. Harness:

1.5.2.1. Model: Swing Connect Race, size L, with a Date of Manufacture listed as 01 August 2012.

1.5.2.2. Manufacturer Description: "*The Connect Race from Swing brings an extremely comfortable **XC and competition pod harness** to the market.*"

1.5.2.3. Identification: Serial Number: 4-328-08.12-08.12-0103W

Figure 11: Sample photo sourced from https://flybubble.com/swing-connect-race

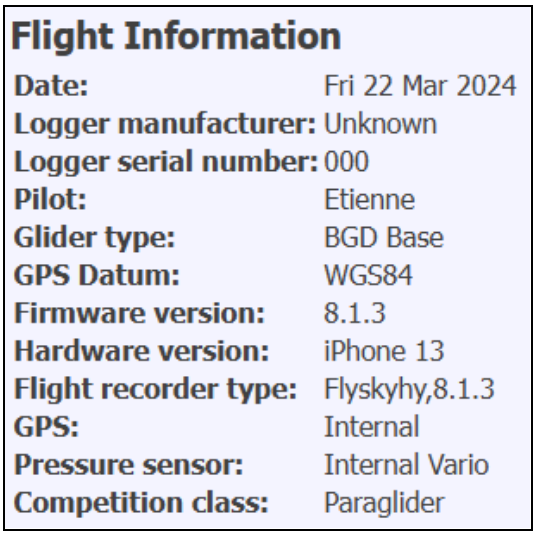
1.5.3. Rescue Parachute:

1.5.3.1. Model: Independence Annular Evo (size 22). Date of manufacture: 01 Jan 2015

1.5.3.2. Identification: Serial number: 42686

1.5.4. Other:

A mobile device was used in flight. The tracklog made available for this investigation provides the following details:



Flight Information

Date:	Fri 22 Mar 2024
Logger manufacturer:	Unknown
Logger serial number:	000
Pilot:	Etienne
Glider type:	BGD Base
GPS Datum:	WGS84
Firmware version:	8.1.3
Hardware version:	iPhone 13
Flight recorder type:	Flyskyhy,8.1.3
GPS:	Internal
Pressure sensor:	Internal Vario
Competition class:	Paraglider

Figure 12: IGC file format tracklog information

1.6. Meteorological information

1.6.1. Weather forecasts

1.6.1.1. The Regional Atmospheric Soaring Prediction (RASP) is a model popular with the soaring disciplines in the Western Cape including paragliding and sailplane gliding. This model takes into account the local terrain in its calculation of airflow characteristics. The resolution of the forecast presented in the RASP forecasts below is 4km. The forecast is available at www.rasp.org.za.

1.6.1.2. RASP 11 am Surface Wind Forecast

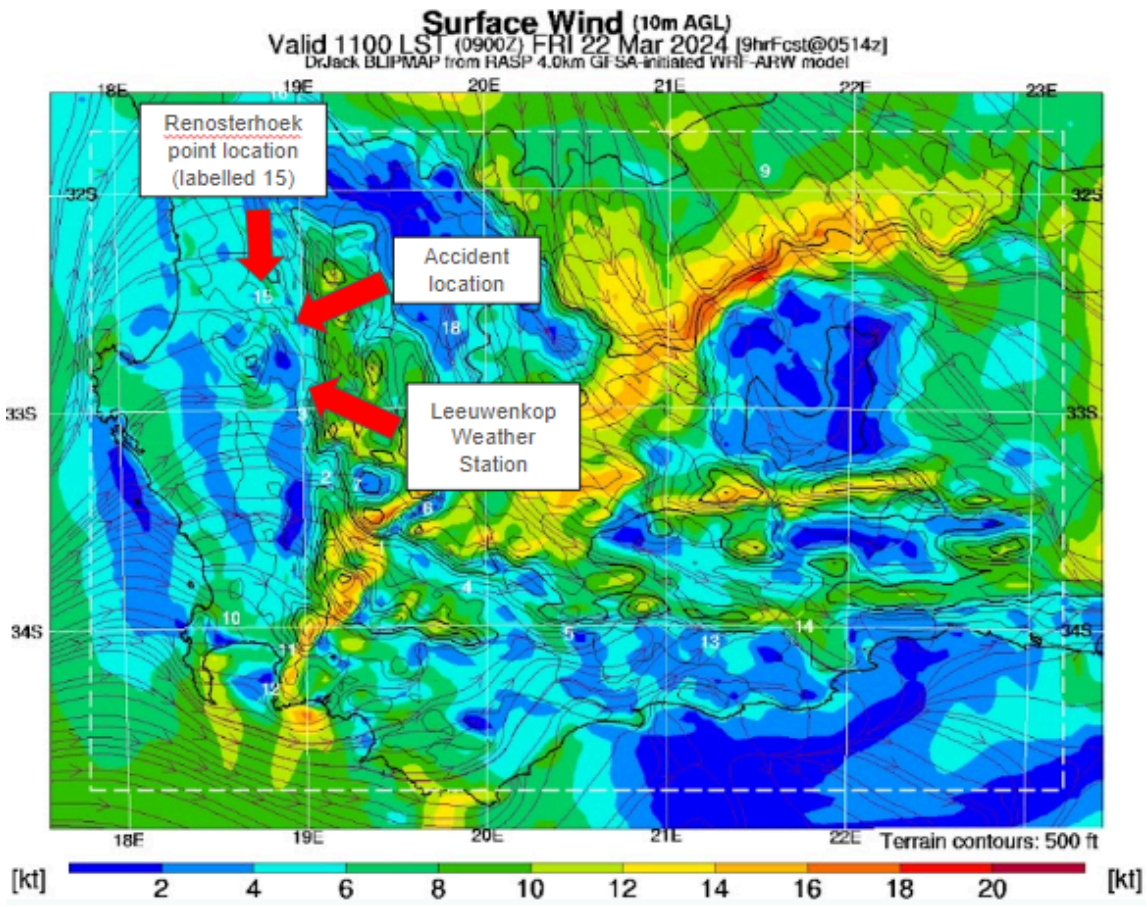


Figure 13: RASP 11 am Surface wind forecast. Map orientation north facing up.

The following points are worth noting:

- The surface wind forecast for the accident site is up to 6 kts (11kph) north-west
- The surface wind forecast for the Leeuwenkop weather station (the closest available weather station with live readings) is similar at 6kts (11kph)

1.6.1.3. RASP 2 PM Surface Wind Forecast

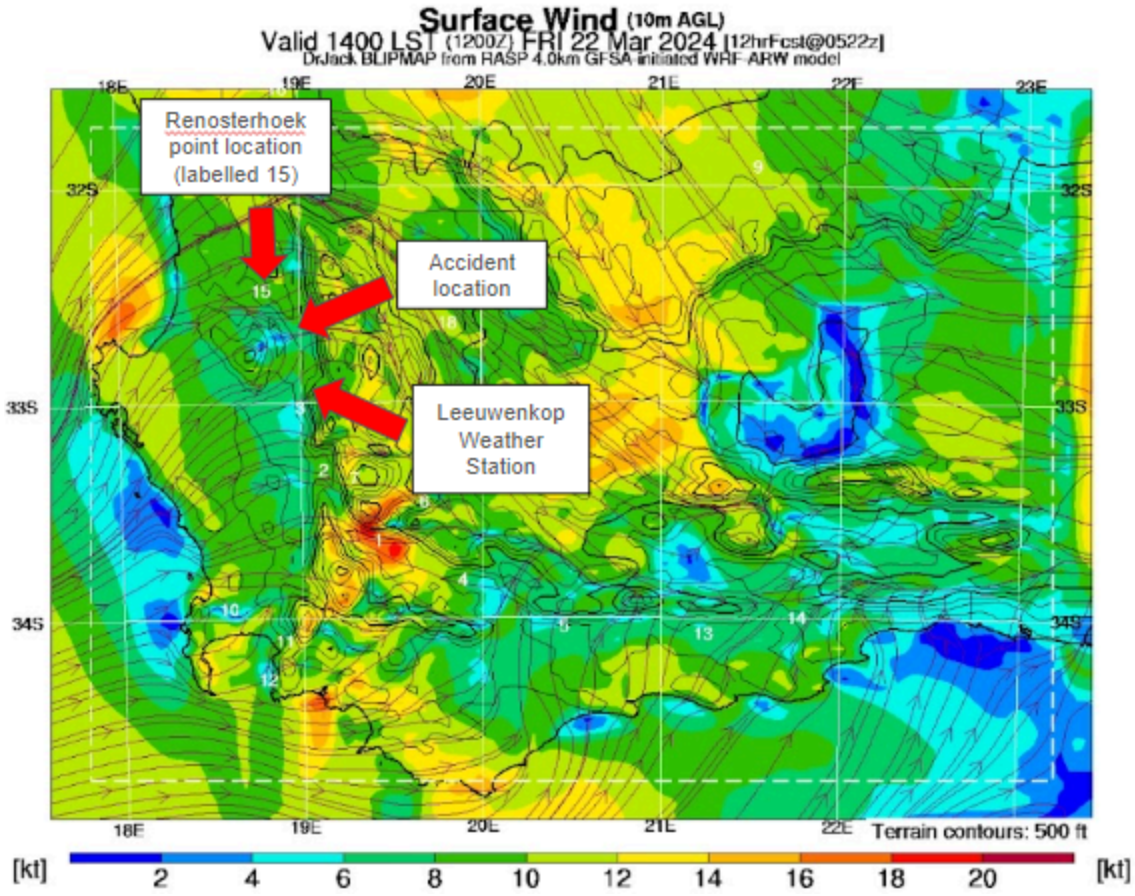


Figure 14: RASP 2 PM Surface wind forecast. Map orientation north facing up.

The following points are worth noting:

- Surface wind speed forecast for the accident site is around 8kts to 10kts (15 to 19kph) west
- The surface wind forecast for the Leeuwenkop weather station (the closest available weather station with live readings) is around 8kts to 10kts (15 to 19kph) south-west

1.6.1.4. RASP 11 am Boundary Layer Wind Forecast

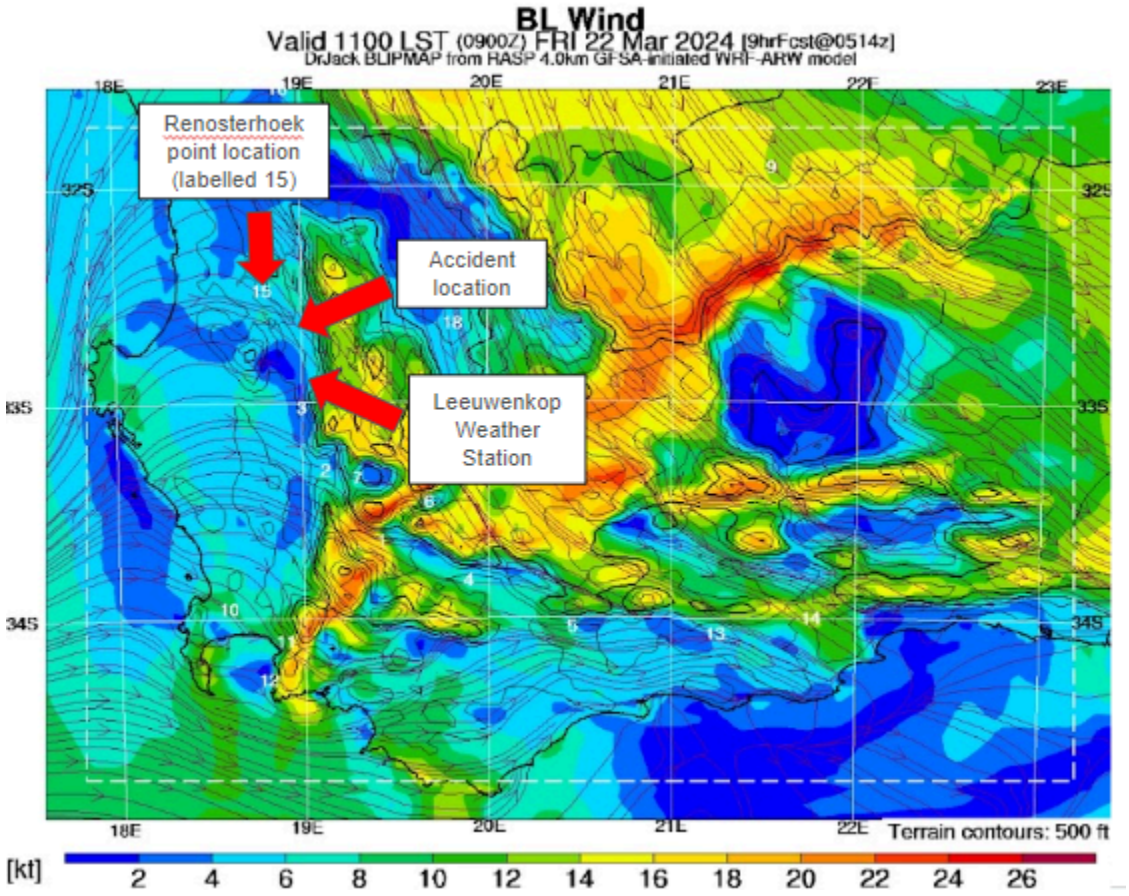


Figure 15: RASP 11 AM boundary layer average wind forecast. Map orientation north facing up.

The following points are worth noting:

- The boundary layer is the layer of air in which thermals from the ground level rise. The type of paragliding flight used in the case of this accident was that of thermal flying. The forecast average boundary layer wind gives an idea of the average wind speed above ground level and within which this paragliding flight would have taken place.
- The boundary layer average wind speed forecast for the accident scene is up to 6kts (11kph) WNW
- The boundary layer average forecast for Leuwenkop weather station is similar at up to 6kts (11kph) direction WSW.
- The Boundary Layer average wind speeds are similar to the surface winds indicating that there's a negligible increase in wind speed with altitude from ground level below thermal top altitude

1.6.1.5. RASP 2 PM Boundary Layer Wind Forecast

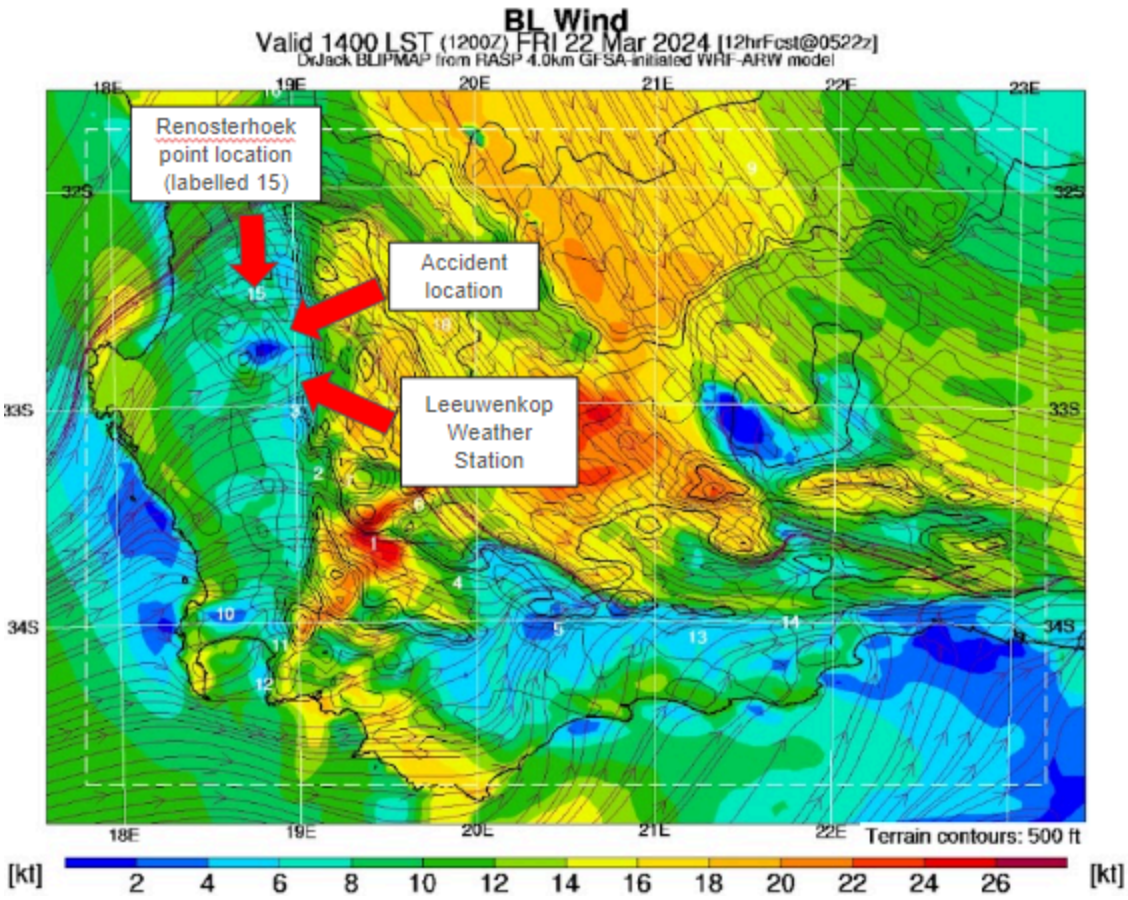


Figure 16: RASP 2 PM boundary layer average wind forecast. Map orientation north facing up.

The following points are worth noting:

- The boundary layer average wind speed forecast for the accident scene is around 8kts (15kph) W
- The boundary layer average forecast for Leuwenkop weather station is similar at around 8kts (15kph) from the direction WSW.

1.6.1.6. SkySight Wind Forecast for the Accident Site

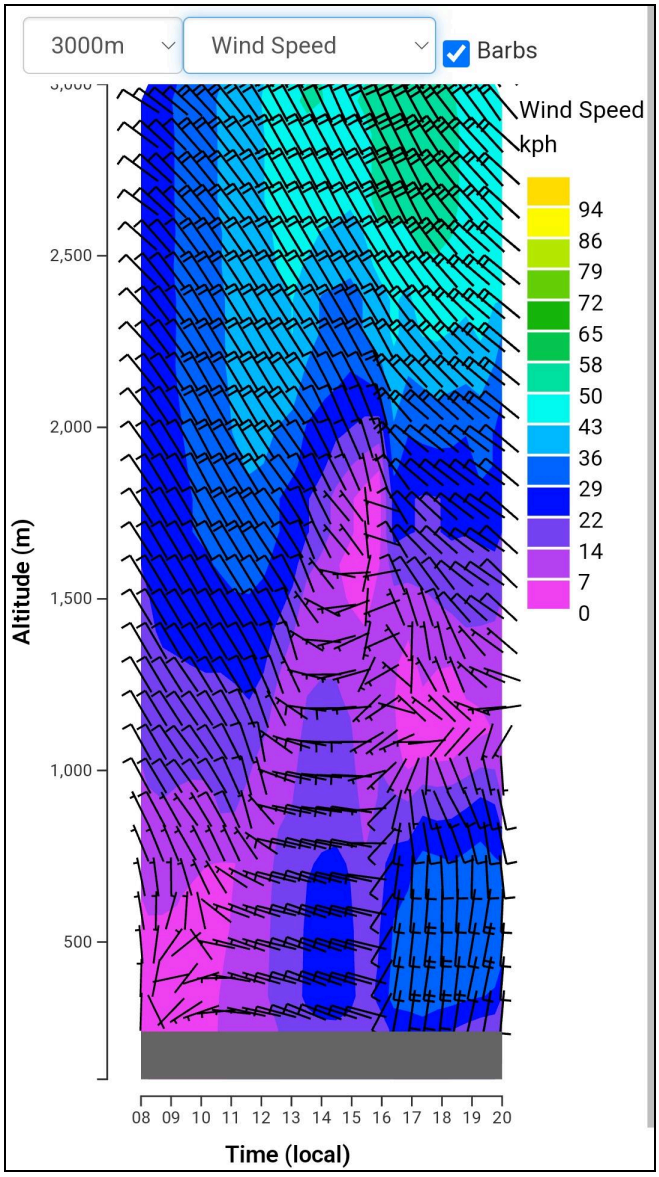


Figure 17: SkySight weather model wind forecast by altitude and time of day.

1.6.1.7. SkySight Wind Forecast for the Accident Site

From the above graph, we can see that this weather model forecasts as WNW wind direction with the wind speed in the 14kph to 22kph range around 1 pm (the time of the accident). The forecast also shows an increase in wind speed around 13h30 to 15h00 before dropping off again and then increasing significantly from a southerly direction in the evening.

1.6.2. Leewenkop weather station readings

1.6.2.1. Weather station readings were sourced from the Leewennkop weather station hosted by iWeathar.co.za. This station is located at a different paragliding site approximately 34km south of the accident scene.

Figure 18: Location of Leewenkop weather station relative to the accident site. Map orientation north facing up (Google Maps screenshot).

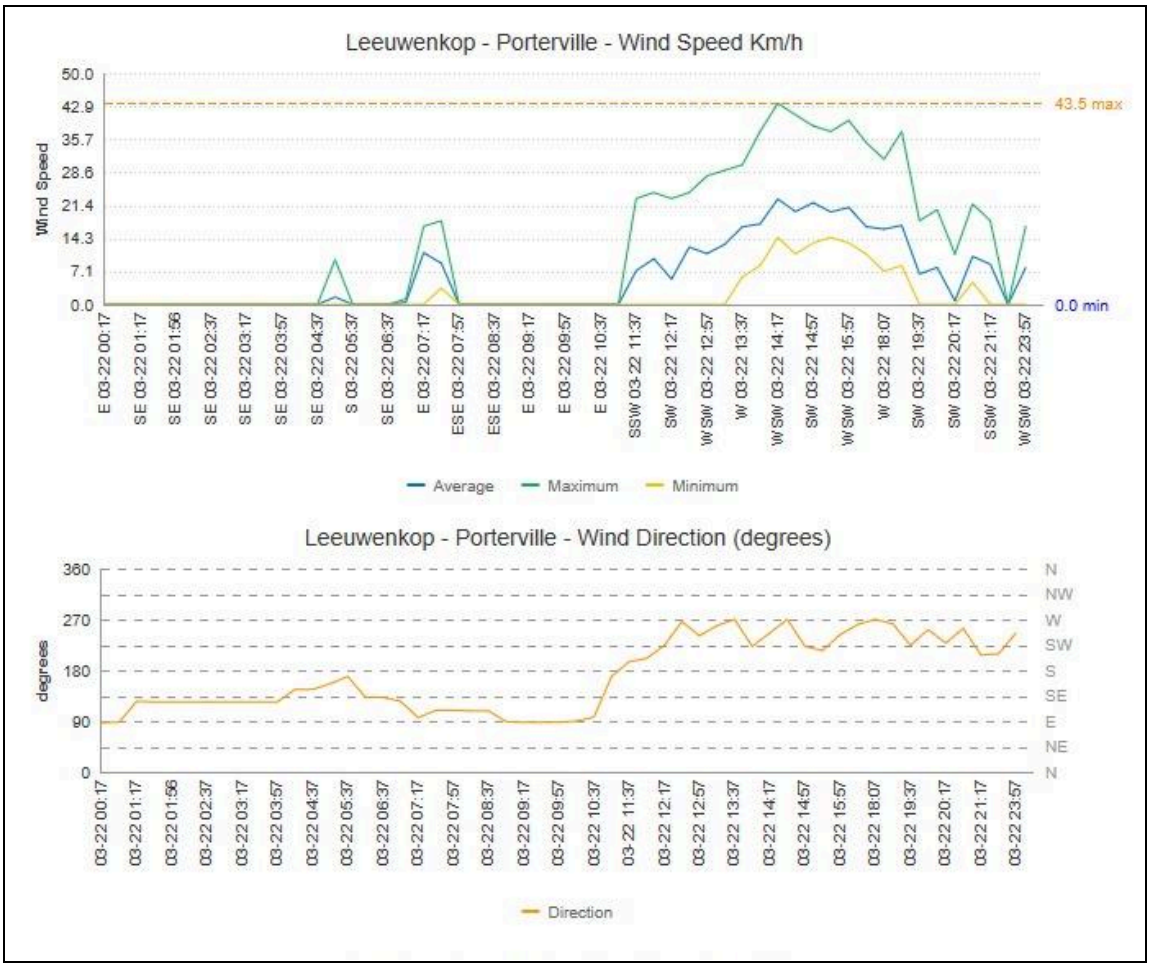


Figure 19: Leuwenkop weather station wind over time

Noteworthy points:

1) At ~1 pm the average wind speed was ~14kph from the WSW
2) At ~1 pm the maximum wind speed was ~ 29kph
3) The wind speed trend shows an increasing trend in strength from ~12h00 to ~14h15 and then a decrease till late at night at ~22h00. The direction in this period varied between W and SW

1.6.3. Witness Statements

1.6.3.1. Five witness statements were reported to SAHPA via the online reporting system. All witnesses are licensed paragliding pilots with varying degrees of experience. The following information is extracted from these statements, selected by the author of this report in

terms of providing relevant information towards the understanding of the contributing factors to this accident.

1.6.3.2. Weather conditions

Witness	Temp (deg C)	Wind Strength	Wind Dir Takeoff	Wind Dir Landing	Gust Factor	Visibility	Thermal Strength
1	Hot (29 - 45)	16 - 25kph	SW	S	>10kph	Good	< 2m/s
2	Hot (29 - 45)	6 - 15kph	SW	SW	5 - 10kph	Good	< 2m/s
3	Hot (29 - 45)	16 - 25kph	SW	SE	>10kph	Good	2 - 4m/s
4	Warm (22-28)	6 - 15kph	S	SE	5 - 10kph	Good	2 - 4m/s
5	Warm (22-28)	6 - 15kph	SW	S	NA	Good	2 - 4m/s

1.6.3.3. Weather Commentary

- After takeoff conditions were lovely, playing around and waiting for the start gate. Then conditions changed, and several pilots sank out and landed. This witness's vario indicated south wind. The wind on landing was straight south and strong.
- It was a pre-frontal day and very hot. The wind was predicted to be NW but was more SW
- Was flying for approximately one hour before noticing a lot of sinking air, and flew out to the designated landing area. The wind turned south on landing and the air was getting very turbulent
- The wind direction changed on the day. The forecast was NW with pilots arriving at the NW facing taking off. Actual wind was SW so all pilots moved to the SW facing taking off. The wind on takeoff was SSW, after about 20 minutes of flying the wind changed to become more south and possibly even SSE. Flew away from the ridge where conditions started to get turbulent.
- The maximum climb rate on vario was 2.7m/s on the flight, with an average climb rate of 0.8m/s on the witness's best thermal of the flight.

1.6.3.4. Incident descriptions

- Didn't like the conditions at the time of the incident, into-wind speed was low (~5kph). Saw the pilot's glider surging, then going into an auto rotation. The glider appeared to stabilise and then went into another two auto rotations hitting the ground
- The witness landed about 5 minutes before the incident. Didn't witness the actual accident. Was flying along the ridge and started to sink out - left the ridge and flew west into flats to find a landing. Experienced small bubbles of lift, though nothing strong. Landed along with several other pilots. Was

approximately 300m from the accident scene. Reports radio calls to medics had taken place. The pilot appeared dead with severe bleeding, bruises and a puncture wound to the neck. No obvious damage to the wing or harness. Harness straps were cut after the accident to remove the pilot from the harness. The pilot's helmet was removed for CPR.

- After landing the witness reports hearing a glider collapse in front of him and then saw the pilot's glider fall to the ground with a loud bang when it hit the ground. The accident was about 200m away. Ran to the scene. The pilot was non-responsive. CPR was commenced along with another attending witness. Medics arrived and continued up until the pilot was declared deceased.
- Whilst flying away from the ridge the witness saw the pilot was low and close to the terrain, the glider was in an uncontrolled spiral close to the ground.
- Half an hour into the flight the wind changed from W/SW to S i.e. blowing parallel to the ridge line. Noticed pilots sinking out and decided to leave the ridge due to sink and concern about possible rotor close to the ridge. Landed in strong wind but able to keep the glider up and walk with it overhead although at a slow speed and with some effort. Heard nearby witnesses gasp and scream and turned to see the pilot impact the ground at a high speed. Ran to the accident scene to assist. Reports that the pilot's helmet, flight instrument and phone were all detached lying close to the pilot. First aid was commenced along with other attending persons on the scene.

1.6.3.5. Witness opinions on the possible contributing causes of the accident:

- Wind/Thermal
- Lee Rotor
- Equipment failure
- Stall
- Inexperience
- Strong wind

1.6.4. Other pilots tracklog analysis

1.6.4.1. Analysis of the available tracklogs reveals the following

- 12h11 - tracklogs thermal drift indicates a west-south-west wind direction
- 12h31 - tracklogs thermal drift indicates a southerly wind direction
- 12h54 - two pilots land in the vicinity (~200m west) of the soon-to-be accident scene. The final glide of both pilots indicates a south-south-east wind direction (assuming they both flew into the wind on finals)
- 12h55 - tracklogs thermal drift indicates a southerly to south-south-east wind direction with a calculated wind speed of approximately 24kph at ~700m ASL i.e. above ridge height
- 13h05 - tracklogs thermal drift indicates a southerly wind direction with a calculated wind speed of approximately 26 kph at ~550m ASL and in the vicinity of the accident scene

1.7. Aids to navigation

1.7.1. Mobile Device

From the tracklog available a mobile device was used during the flight. This is common practice in the paragliding community. A paragliding-specific navigation app called FlySkyHy was used which resulted in the IGC (paragliding tracklog type format) tracklog that is available. It is the same app whose data includes that of the electronic logbook analysed in this document.

1.8. Communication

1.8.1. VHF Radio:

There are no records of a VHF radio as part of the pilots' equipment. The consequence of this is not relevant to the events that unfolded hence no further effort was made by the author of this report to verify this statement.

1.8.2. Mobile device

The pilot had on board with him a mobile device.

1.9. Aerodrome information

The flight started from the Kardoesie SW takeoff site (32°38'10.4"S 18°56'24.4" E) at an altitude of ~630m ASL. This is a registered takeoff site commonly in use by paragliding pilots in the Western Cape, including for paragliding student training.

1.10. Flight recorders

1.10.1. IGC Tracklog

1.10.1.1. An IGC format tracklog from the pilot's mobile device was available. The results of which are presented below. It should be noted that mobile device GPS results for quick altitude changes are subject to error

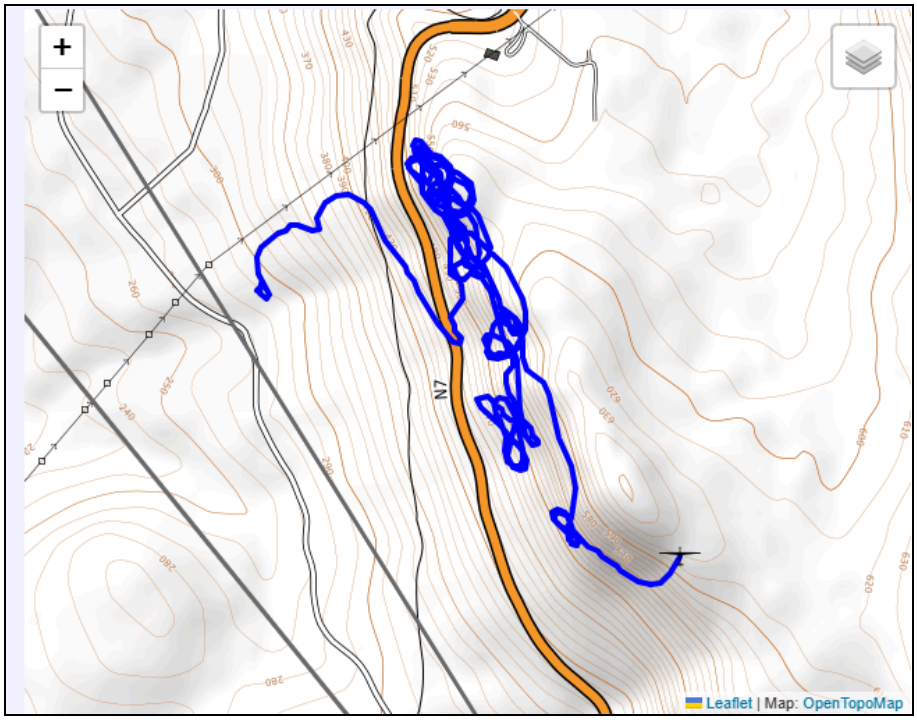


Figure 20: Overall flight path derived from the available tracklog. Map orientation north facing up.

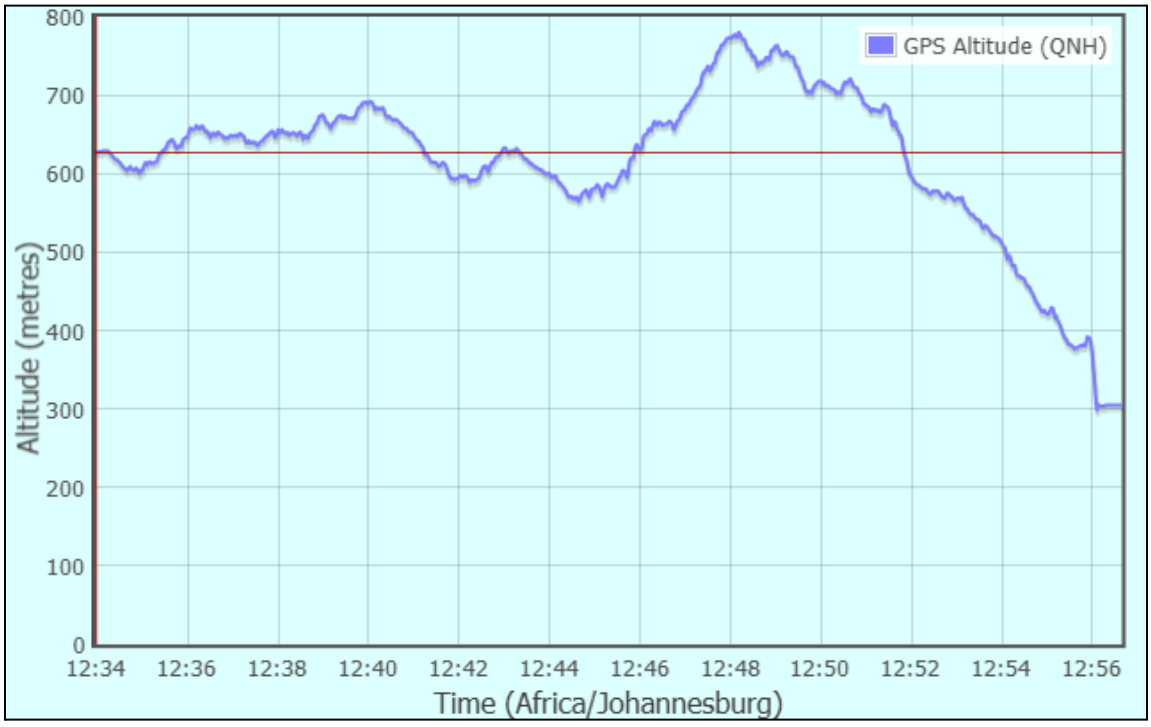


Figure 21: Flight altitudes throughout the flight

1.10.1.2. 3D Views show the pilot flying along the ridge on which the accident occurred. NB. The track overlay against the image topography is not perfectly aligned, i.e., the track is displayed higher than the actual ground level, as evident from the endpoint floating above the imagery ground level.

Figure 22: Side view leading down to the accident site.

1.10.1.3. Towards the end of the flight the pilot flies away from the ridge, then turns to fly on a southerly heading just before the end of the flight

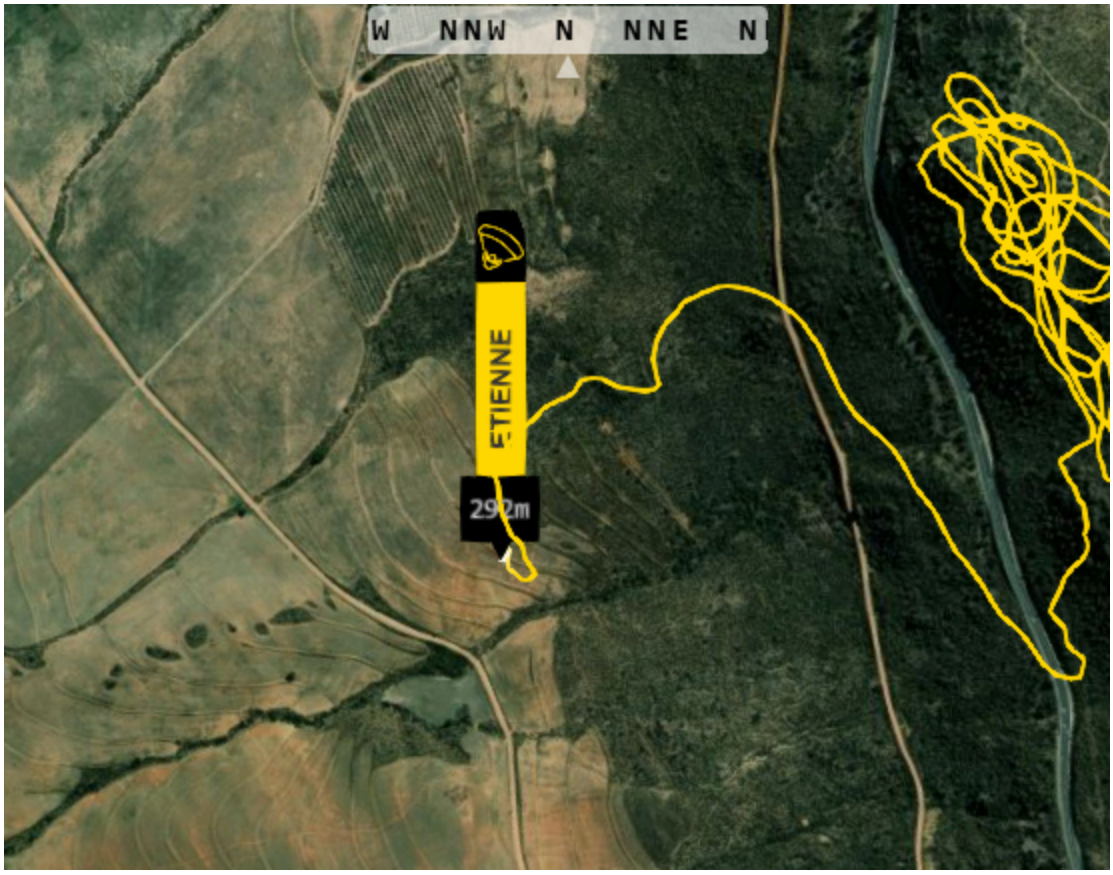


Figure 23: Top view of the last section of the flight

1.10.1.4. The pilot climbs for a few seconds before going into a right turn and rapidly losing altitude until impact.

Figure 24: Side view showing the last section of the track. NB. The end of the track is at ground level - the gap that appears in the screenshot is an image overlay issue with the software used to create this visualisation

1.10.1.5. Topographical analysis shows the presence of a spine upwind of the accident scene. This spine is highlighted in yellow in the snapshot below. The 300m contour interval is highlighted with a red dashed overlay to assist with interpreting the topography.

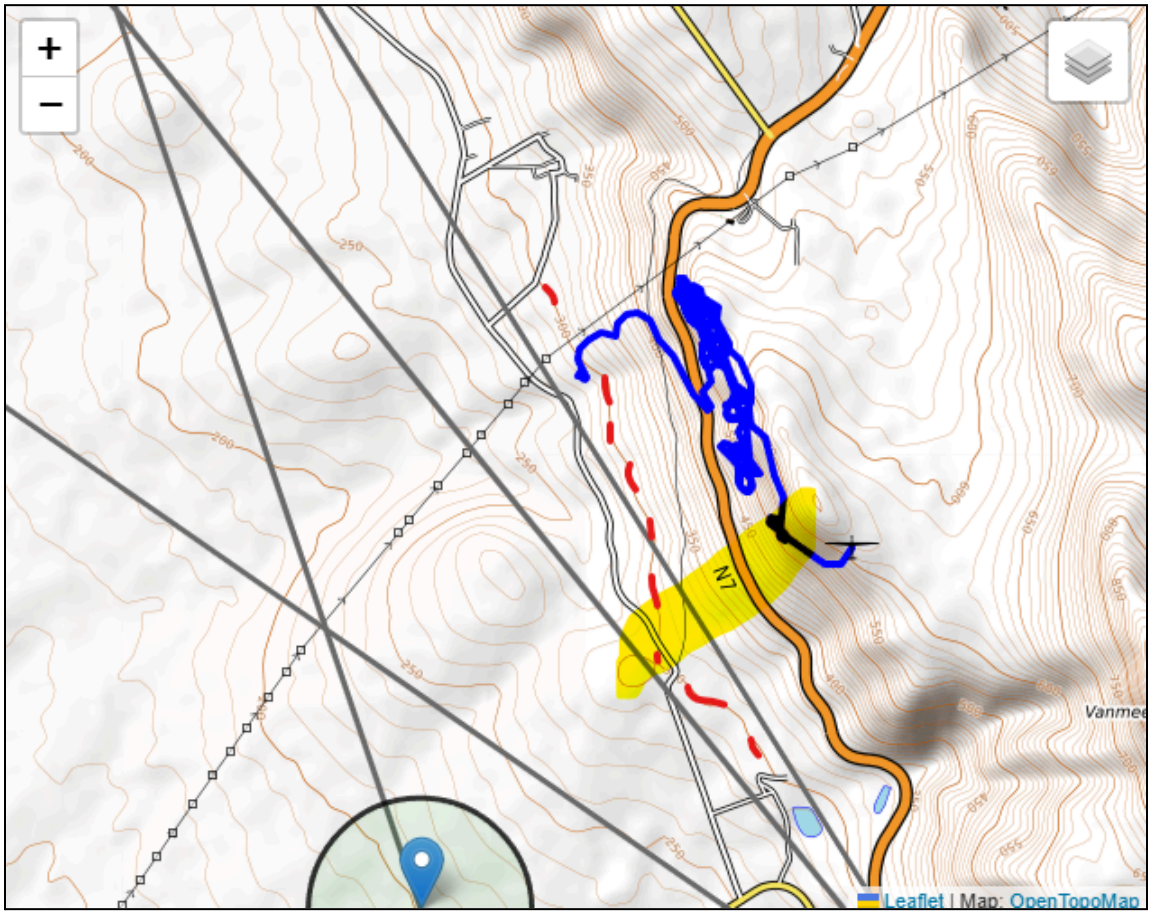


Figure 25: Topographical features within the vicinity of the flight

1.10.1.6. Analysis of GPS Altitude **for the last 60 seconds of flight.** The significant loss of altitude at the end starts at 12:55:57 when the GPS altitude is 376m ASL and ends at 12:56:08 at 292m ASL. This equates to a loss of 84m over 11 seconds before impact.

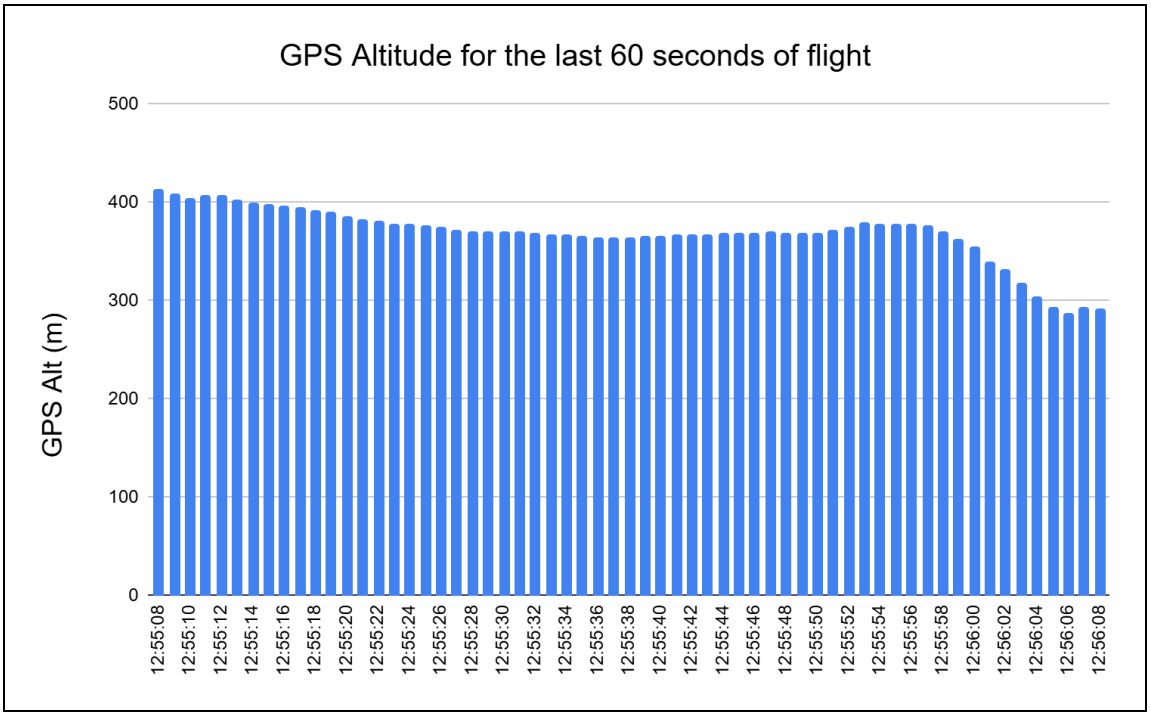


Figure 26: Tracklog derives GPS speed for the last 60 seconds of flight

1.11. Wreckage and Impact information

1.11.1. Location of the accident: 32°38'10.4"S 18°56'24.4"E

1.11.2. The terrain is on the lower slope of a mountain on a farm field.

1.11.3. Located west of Piekinierskloof Pass on the N7 highway.

1.11.4. Witness statements indicate that the pilot was found with a weak pulse, unconscious, with significant blood loss.

1.11.5. Power lines in the vicinity, ~200m away from the accident site at its closest point

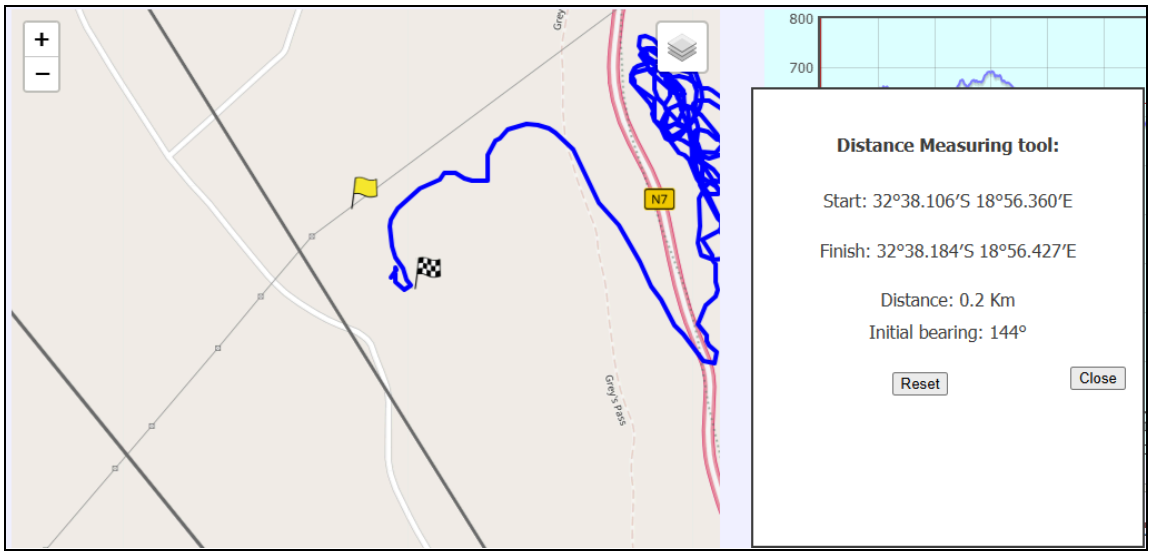


Figure 27: Accident location including power-line proximity (~200m between flags diagram). Map orientation with north facing up.

1.12. Medical and Pathological Information

1.12.1. The chief post-mortem findings include: multiple significant injuries with a larger proportion to the right side of the body

The chief post-mortem findings made by me on this body were -

1. The body of adult male.
2. Abrasions on the right side of the neck,right upper arm,chest anterior,abdomen and left arm.
3. Penetrating irregular shape wound on the right side of the neck,tract upwards,with bruising of the right and left omohyoid muscles,the right digastric muscles and right(small perforation) of the carotid artery.
4. Bruises on above the right clavicle and above the right hip.
5. No skull fractures.
6. Brain swollen with a smear subarachnoid haemorrhage.
7. Rib fractures right 1st-7th and 9th rib and left 1st-5th rib.
8. Blood in trachea.
9. Bilateral multilobar lung contusions with blood aspiration and collapsed right lung.
10. Bilateral hemothoraces.
11. Laceration of the aorta.
12. Right sacroiliac joint dislocation.
13. Organs pale.

Figure 28: Snapshot of post-mortem findings

1.12.2. The conclusion from the chief post-mortem findings states that the cause of death was "**Blunt force trauma with multiple injuries**"

1.13. Fire

1.13.1. Did not occur

1.14. Survival Aspects

1.14.1. The accident took place at 12h56. Witness reports from WhatsApp message times indicate first responders wither on the scene within minutes. No pulse was first reported at 12h59 (although this was later changed to “weak pulse” shortly thereafter). Post-mortem injury analysis as well as witness statements suggest no survival aspect due to significant injuries.

1.15. Tests and Research

1.15.1. A full post-accident inspection of the pilot’s equipment was commissioned by SAHPA. An independent paragliding service centre performed the inspection. The following are the key findings from this report

1.15.2. Post-accident inspection report key findings: ”*The conclusion of the inspection is that the **glider needed slight trim adjustment, however I do believe that this would not have contributed to the accident**. On inspecting the harness, I noted that a reserve parachute was installed. The reserve pocket was open, but **it does not look like the reserve was attempted to have been deployed**.*”

1.15.3. Glider certification and Behaviour from external tests:

1.15.3.1. This glider was certified as EN B (as stated on the manufacturer's website and user manual)

1.15.3.2. According to the DHV (German paragliding association) tests available on their website, pilot skill requirements are described as:

> “*Pilots should be able to recognise the onset of instability and be able to prevent or minimise glider reactions through **immediate and precise pilot inputs**. **Expert piloting skills** and **regular flight practice (>50 hour per year)** necessary.*” Sourced from https://service.dhv.de/db3/muster/safetyclass/id/-2873

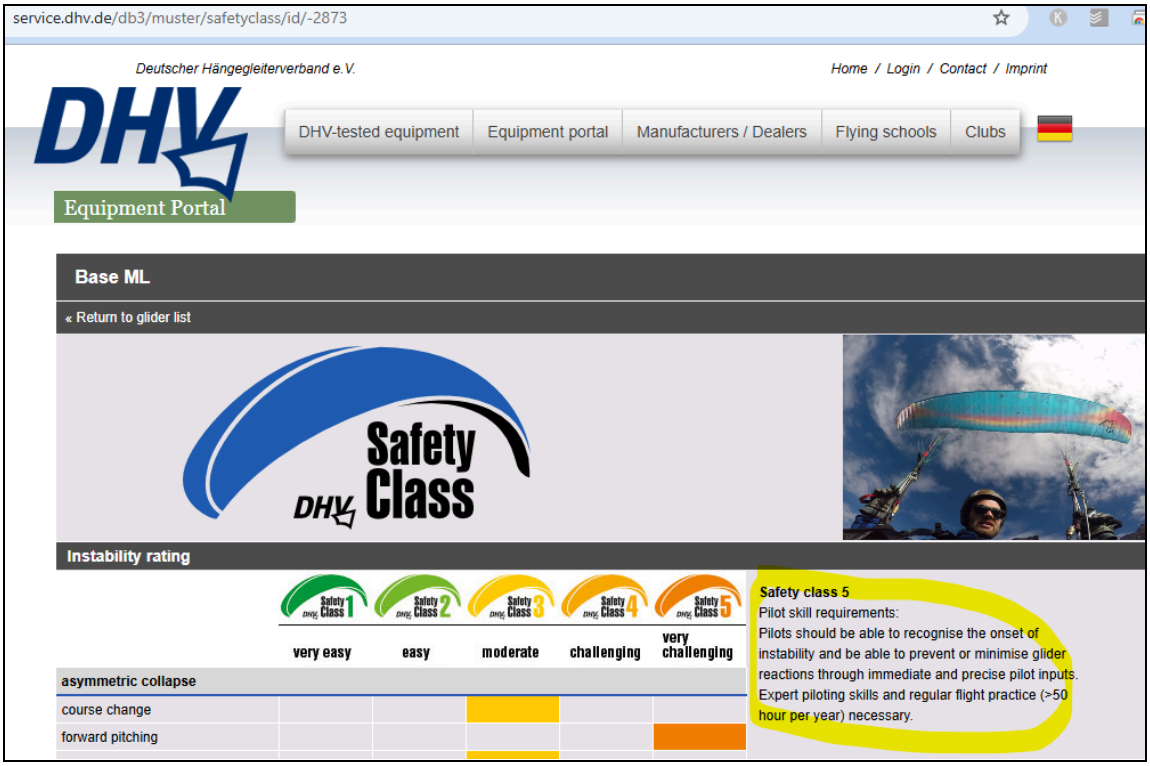


Figure 29: Screenshot of DHV test on glider model

1.16. Additional information

1.16.1. Useful or effective investigation techniques:
https://www.skybrary.aero/articles/accident-investigation-techniques-best-practices

2. Findings

2.1. Weather

2.1.1. Analysis of the various forecasts shows that the wind speed expected for the time of flight was acceptable for the proposed flight

2.1.2. Analysis of various tracklogs as well as witness statements confirms a change in wind speed and direction with the wind direction coming from south to south-south-east direction i.e. parallel to the mountain ridge at the location of the accident. The strength increased sharply around the time of the accident, though still within the limits of what would be considered acceptable for the flight undertaken. The choice of flying close to the ridge when the conditions were that of the pilot, other pilots chose to fly off the ridge and some also chose to go to landing.

2.1.3. Mild thermal activity was prevalent on the day

2.1.4. Analysis of the wind speeds at the Leeuwenkop weather station near Porterville, along with the SkySight weather forecast, suggest that the forecast strong southerly wind expected later in the evening arrived a lot earlier than expected.

2.1.5. Turbulence

Witness statements indicate that the glider experienced turbulence which resulted in a collapse. Analysis of the pilot's injuries, tracklog and witness statements indicate that the pilot likely had an asymmetrical collapse on the right side of the right side of glider which resulted in a right-hand rapid descent turn.

2.1.5.1. Mechanical leeward side rotor

Analysing the wind speed, direction and topography of the terrain it is possible that mechanical turbulence was created by the wind strength, direction and shape of the topography along which the pilot was flying.

2.1.5.2. Thermal turbulence

It is possible that the pilot experienced turbulence due to thermic activity given that thermal flying was the type of flying taking place at the time of the accident.

2.2. Rescue Deployment

2.2.1. There was no indication of an attempt to deploy the rescue parachute. This implies a mindset of trying to recover the glider.

2.2.2. The pilot's tracklog shows a rapid loss of altitude at the end of the flight lasting 11 seconds - this time length indicates sufficient time for the deployment of a reserve parachute which could have changed the outcome of this accident.

2.3. Pilot Skills

2.3.1. In terms of the applicable regulations, the pilot was flying a glider that he was legally qualified to fly.

2.3.2. Given that the pilot license level is that of a "Basic license" it is unlikely that this pilot underwent any SIV training where turbulence control manoeuvres are taught.

2.3.3. Currency - analysis of the pilots over the preceding 12 months shows that flights took place on an ad hoc basis, with some months not flying at all. The pilot's cumulative airtime monthly would be considered low by general paragliding standards.

2.3.4. Thermal flying experience - analysis of the pilot's takeoff locations shows that he was familiar with inland mountain flying conditions. However, analysis of flight duration, altitude gains, and distance from takeoff speak to short flights with limited thermal experience. This infers limited turbulence control experience.

2.3.5. Turbulence control - witness statements speak to the glider almost recovering and then going back to a loss of control. Incorrect input from the pilot likely stopped the glider from recovering.

2.3.6. Choice of flight path - shortly before the accident the pilot was flying away from the mountain in sinking air, before changing heading, to fly parallel to the ridge and into it wind. It is unknown whether the reason for this heading change was to fly away from the power lines in the vicinity, to fly towards the designated landing field, or for some other reason. However, this choice of flight path had the following two implications:

2.3.6.1. Flying towards the leeward side of the spine of the mountain highlighted in Figure 25 with possible rotor given the wind strength and direction.

2.3.6.2. Flying into the wind reduced his ground speed, this kept him closer to the mountain for longer. Had he turned onto an NW heading he would have had a higher ground speed which would have resulted in him flying away from the ridge quicker as well as gaining altitude above ground level as the terrain drops away from the ridge.

2.4. Equipment

2.4.1. Inspection reports indicate that the equipment was airworthy and that the equipment's condition was unlikely to be a contributing cause to the accident.

2.4.2. Analysis of the pilot's flight experience, as well as the DHV test report, suggest that the glider model demands were above that of the pilot's experience level. The DHV recommendation for this glider is 50 hours a year. In the 12 months preceding the accident, the pilot had a total of 6.15 hours of flying time. Analysis of the pilot's flight experience suggests that the pilot was still at a beginner level in terms of thermal flying and xc experience.

2.4.3. The addition of a pod harness to the pilot's equipment would have increased the performance of the aircraft setup (combination of glider and harness) however it would have also increased the demands on skills required by the pilot, especially in a turbulence-related loss-of-controll scenario. Given the pilot's flight history, it is unlikely that the pilot had sufficient thermal and turbulence control experience for this choice of harness. It should be noted that the harness is marketed as that for XC and Competition flying, given the pilot's flying experience it would be reasonable to deduce that this pilot was not at the experience level of that of an XC or Competition pilot.

2.4.4. Analysis of the pilot's flying history suggests that the change from the Swing Discus (EN A) glider to the BGD Base (EN B) was premature given the flight experiences achieved at the time of the upgrade.

3. Recommendations

3.1. Equipment Choice

3.1.1. It is recommended that SAHPA increase awareness of the risk increase with glider and harness upgrades. Guidance to junior pilots on how to go about upgrading equipment should be considered.

3.2. SIV Training

3.2.1. It is recommended that SAHPA remind pilots of the benefits of SIV training.

3.3. Flying currency

3.3.1. It is recommended that SAHPA educate members of the risks associated with infrequent flying, and the potential risk mitigation options that could be considered such as - flying lower-performance equipment with higher passive safety, adaptations of flying style to reduce risk (e.g. staying off ridges when the wind is strong and side on), etc.