Preliminary Accident Report

Version number: 1.1
Date 29 July 2023

By Ria Moothilal on behalf of SAHPA / SACAA

Figure 1: Cross-country solo paraglider flight resulting in a fatal accident outside the town of Wolseley

Description:

On the 25th of February 2023 at approximately 14h42 (local time), a paragliding pilot had a fatal accident. The pilot was performing a solo recreational cross-country flight. The accident occurred in the Tulbagh Valley on the western mountain ridge near the town of Wolseley. There were no witnesses to the accident. At around 5 pm the pilot was found unconscious by two other paragliding pilots who were sharing the same retrieve vehicle as the pilot. The pilot died at the scene of the accident before medics arrived on site at approximately 7 pm.

INTRODUCTION

Reference Number: SAHPA/103/04/04/2023

Name of Owner/Operator: Nigel Frith

Manufacturer: Ozone

Model: Enzo 3

Nationality: South African

Registration Marks: NA

Place: 33°27.095′S 19°9.047′E

Date: Sat 25 Feb 2023

Time: 14h42 (local time)

Purpose of the Investigation:

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, 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****.*

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

Investigation Process:

On the 4th of April 2023, 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 information 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.

Disclaimer:

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ABBREVIATION	DESCRIPTION
‘	Coordinates minutes (distance)
"	Coordinates seconds (distance)
°	Degrees
℃	Degrees Celsius
AIID	Accident and Incident Investigations Division
ARCC	Aeronautical Rescue Coordination Centre
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
SAWS	South African Weather Service
SIV	Safety Manouvers Training
UH60	Black Hawk Helicopter model

1. Factual Information

1.1. History of Flight

1.1.1. On the 25th of February 2023, a solo paragliding pilot had a fatal accident in the mountains outside the town of Wolseley. The flight was a recreational cross-country flight that started at the Rusty Gate takeoff approximately 70 km south of the accident scene.

1.1.2. The pilot was flying in a group with two other paragliding pilots. A retrieve vehicle followed the pilots to provide transport home after landing.

1.1.3. On the day several other paragliding pilots also took off from the same takeoff site.

1.1.4. According to the available tracklog, the accident took place at 14h42 (local time)

1.1.5. There were no witnesses to the actual accident

1.1.6. The pilot was found unconscious but breathing at approximately 17h00 by the two paragliding pilots in the shared retrieve vehicle. The location of the accident was on a mountain slope approximately 300m above the valley floor.

1.1.7. Emergency services were contacted with heli evac requested at approximately 17h00.

1.1.8. Around 18h15 the pilot stopped breathing, at which point the first responder on the scene initiated CPR.

1.1.9. Medics with helicopter rescue arrived at 19h03 and declared the pilot deceased at 19h17

1.1.10. Due to high wind speeds, the pilot's body was left on the mountain and recovered the following day by rescue services.

1.1.11. The location of the accident site is on the east-facing ridge of the mountain to the west of the town of Wolseley. The terrain is rocky and covered in fynbos. The crash site is approximately 300m higher than the farmland below.

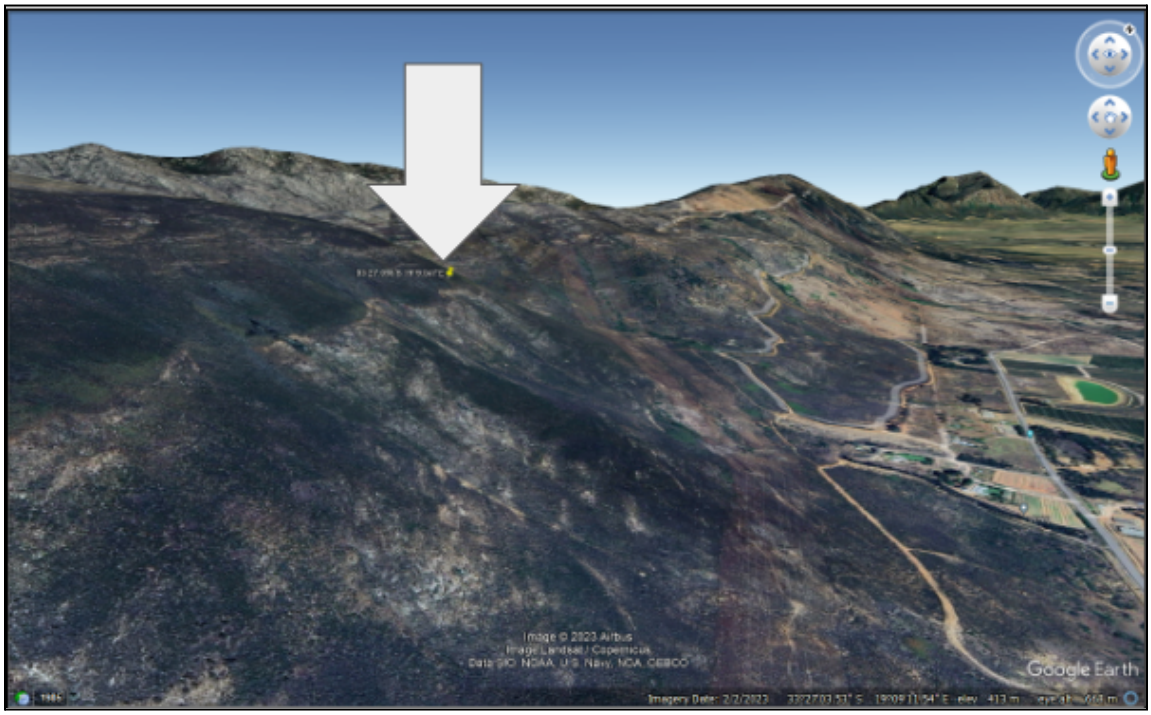


Figure 2: Google Earth snapshot showing the location of the accident

Figure 3: Photo from the accident scene showing terrain with the rescue helicopter at the top

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 after the accident by a service centre appointed by SAHPA.

1.3.2. The following pieces of equipment were inspected: helmet, harness, glider, rescue parachute and variometer.

1.3.3. According to the inspection report, there was no visible damage or other damage that was found due to the accident.

1.4. Personnel information

1.4.1. The pilot was a South African male aged 48 years old.

1.4.2. Licenses held: NPL for Paragliding including Sport License, Grade B Instructor and Grade C Instructor ratings.

1.4.3. Experience: According to the information attained from the pilot's last license renewal (November 2021), the pilot had more than 10000 paragliding flights and more than 5000 hours of total paragliding air time.

1.4.4. The pilot's logbook with recent flight logging was not available for this investigation. His next license renewal would have taken place in November 2023.

B. RENEWAL CHECKLIST:

Current license(s)	SPORT	TFI	GRADE B	Glider(s)	WIN / OZONE
(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	150		Total PG flights since commencing sport		10000 +
PG hours flown during past year	25		Total PG hours since commencing sport		5000 +
Tandem PG flights flown during past year	300		Total Tandem PG flights since commencing sport		5000 +
Tandem PG hours flown during past year	20		Total Tandem PG hours since commencing sport		3000+

Figure 4: Snapshot of pilots flying stats as per the last license renewal in November 2021

1.5. Aircraft Information

1.5.1. Glider:

1.5.1.1. The paragliding wing is an Ozone Enzo 3. Date of manufacture 9th November 2017. The total hours of usage on this wing are unknown.

1.5.1.2. Manufacturer Description: According to the user manual for this wing, "*The Enzo 3 is certified CCC and available in 6 sizes suitable for flying weights from 80kgs to 130kgs. It is a high-performance wing designed for the world's best pilots and, like the Enzo 2, requires a high level of piloting skills.*"

1.5.1.3. Specifications:

Number of cells	101
Projected area (m^2)	20.1
Flat area (m^2)	23.7
Projected span (m)	10.5
Flat span (m)	13.4
Projected aspect ratio	5.5
Flat aspect ratio	7.55
Root chord (m)	2.22
Glider weight (kg)	5.9
In-flight weight range (kg)	95-115
Certification	CCC

Table 1: Specifications for the paragliding wing in use

1.5.1.4. Glider identification:

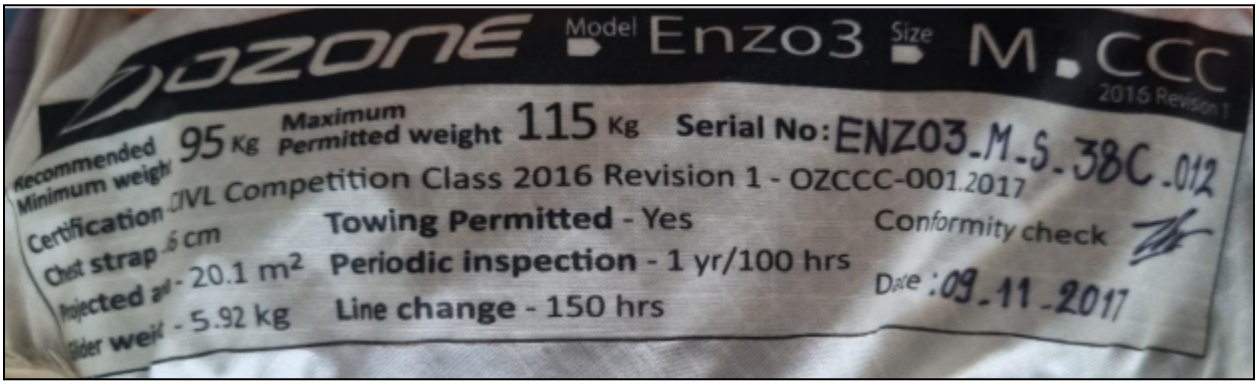


Figure 5: Paragliding wing nameplate

1.5.2. Harness:

1.5.2.1. Model: Gin Genie Lite with a Date of Manufacture listed as 12th April 2019.

1.5.2.2. Manufacturer Description: "*The Genie Lite is the luxury harness of choice for a wide range of pilots who wish to fly with the option of a cocoon (speedbag). The benefits of our flagship competition harness, the Genie Race, are now available in a lightweight, easy-to-use package with several outstanding features.*"

1.5.2.3. Identification:

Figure 6: Harness nameplate

1.5.3. Rescue Parachute:

1.5.3.1. Model: Gin One G size 42

1.5.3.2. Identification:

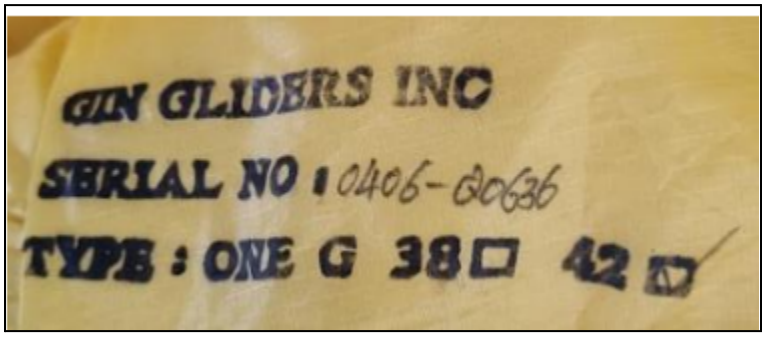


Figure 7: Rescue parachute nameplate

1.5.3.3. Last repack/inspection: The Rescue parachute was packed by a local service centre on the 4th of October 2022.

1.5.4. Helmet:

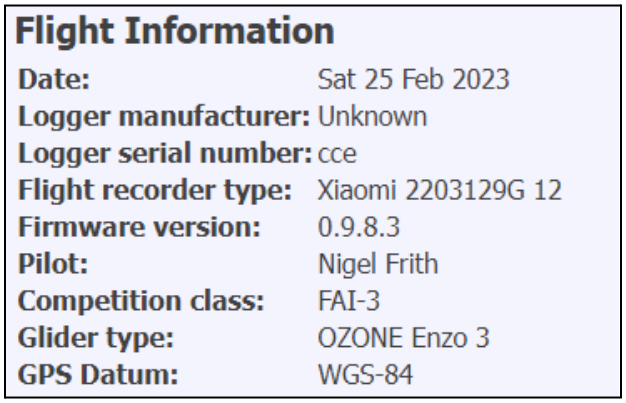
1.5.4.1. Model: Charlie Loop Helmet. EN 966 certified i.e. certified for paragliding activities.

1.5.5. Variometer:

An Aircotec Piccolo was found with the pilot's harness. It is a simple variometer without any track-logging feature

1.5.6. Other:

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



Flight Information

Date:	Sat 25 Feb 2023
Logger manufacturer:	Unknown
Logger serial number:	cce
Flight recorder type:	Xiaomi 2203129G 12
Firmware version:	0.9.8.3
Pilot:	Nigel Frith
Competition class:	FAI-3
Glider type:	OZONE Enzo 3
GPS Datum:	WGS-84

Figure 8: 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 5 pm Surface Wind forecast

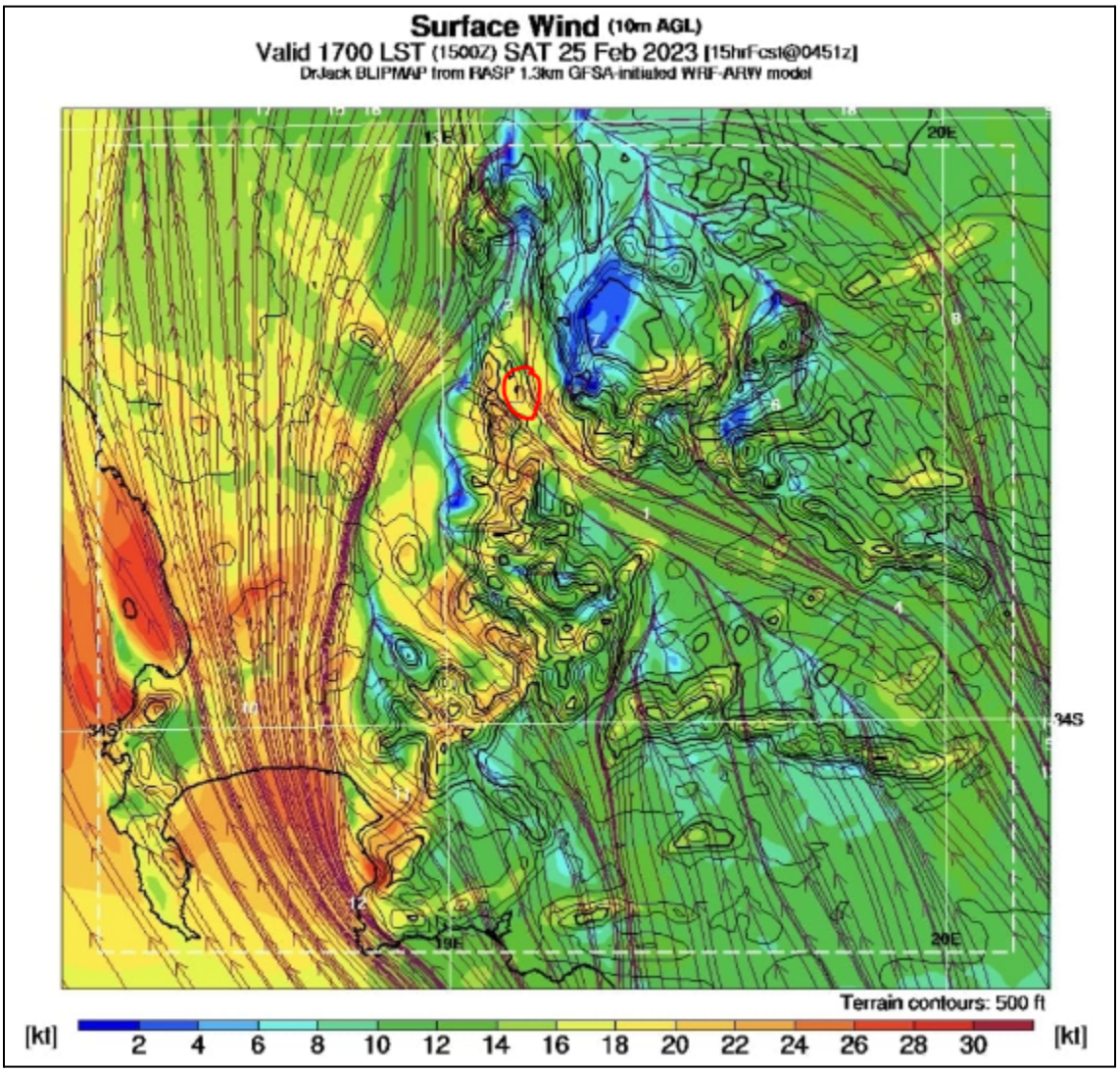


Figure 9: RASP 5 pm Surface wind forecast. Map orientation north facing up. The accident location is circled in red.

The following points are worth noting:

1) Surface wind speed forecast for Worcester (labelled 1 in the RASP diagram) is ~14kts (26kph)
2) Surface wind forecast for the accident site (circled in red) is ~ 20kts (37kph)
3) A southeast wind flowing through the Worcester valley was forecast to turn into southerly wind direction in the valley where the accident occurred.

1.6.1.3. RASP 5 pm Boundary Layer Wind forecast

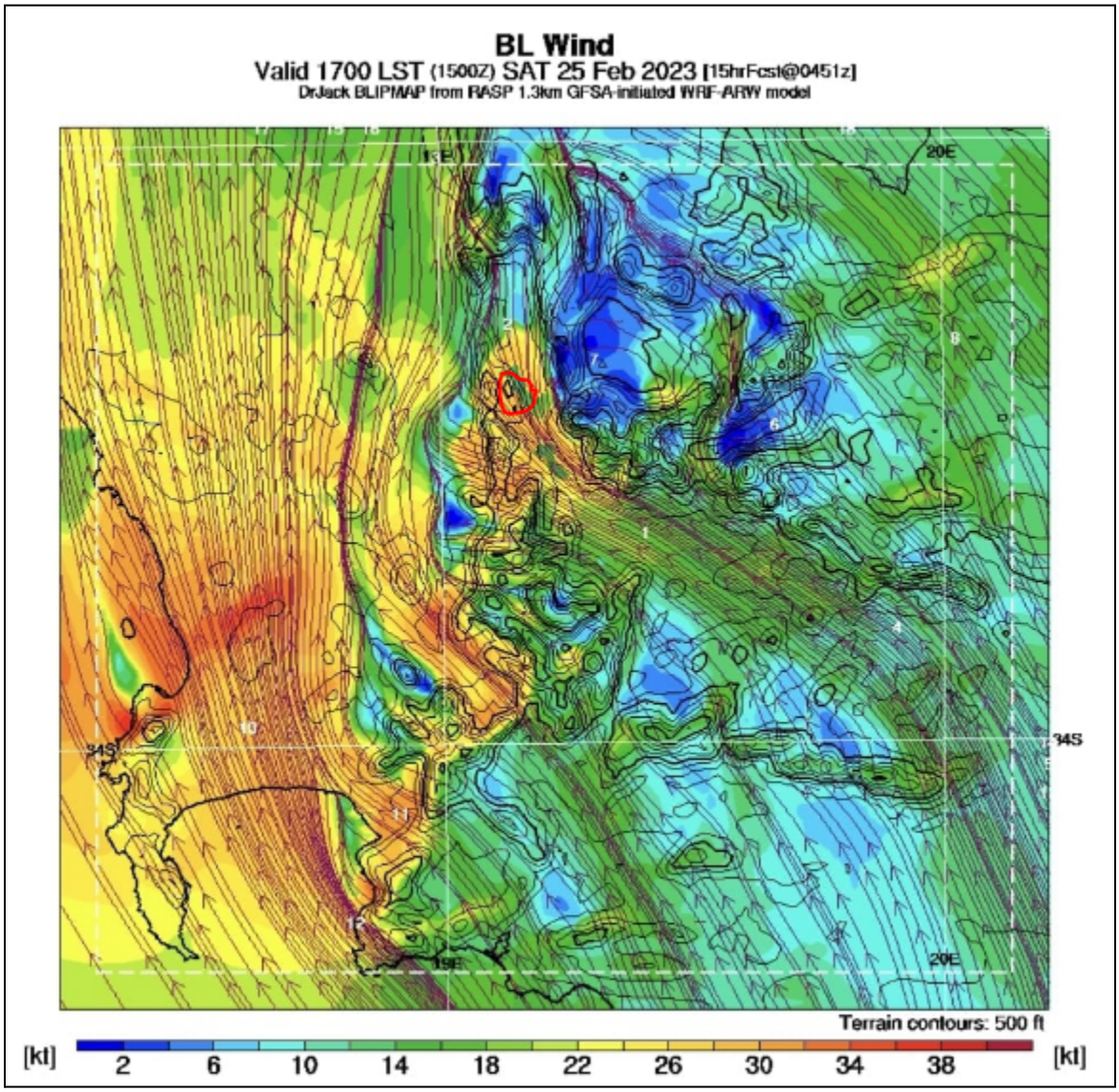


Figure 10: RASP 5 pm boundary layer average wind forecast. Map orientation north facing up. The accident location is circled in red.

The following points are worth noting:

4) The boundary layer is the layer of air in which thermals from the ground level rise up to. 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.

5) Boundary layer average wind speed forecast for Worcester (labelled 1 in the RASP diagram) is ~16kts (30kph)

6) Boundary layer average forecast for the accident site (circled in red) is ~ 30kts (56kph)

7) A southeast wind flowing through the Worcester valley was forecast to turn into southerly wind direction in the valley where the accident occurred.

8) The Boundary Layer average wind speeds are higher than the surface wind speeds, indicating an increase of wind speed with altitude above ground level

1.6.2. Worcester AWS Station readings (SAWS)

1.6.2.1. Weather station readings were sourced from the SAWS. The data provided was five-minute intervals for station “0022729 X - WORCESTER-AWS”. This weather station is in Worcester, approximately 34km southeast of the accident site. The station is located at 204 m ASL

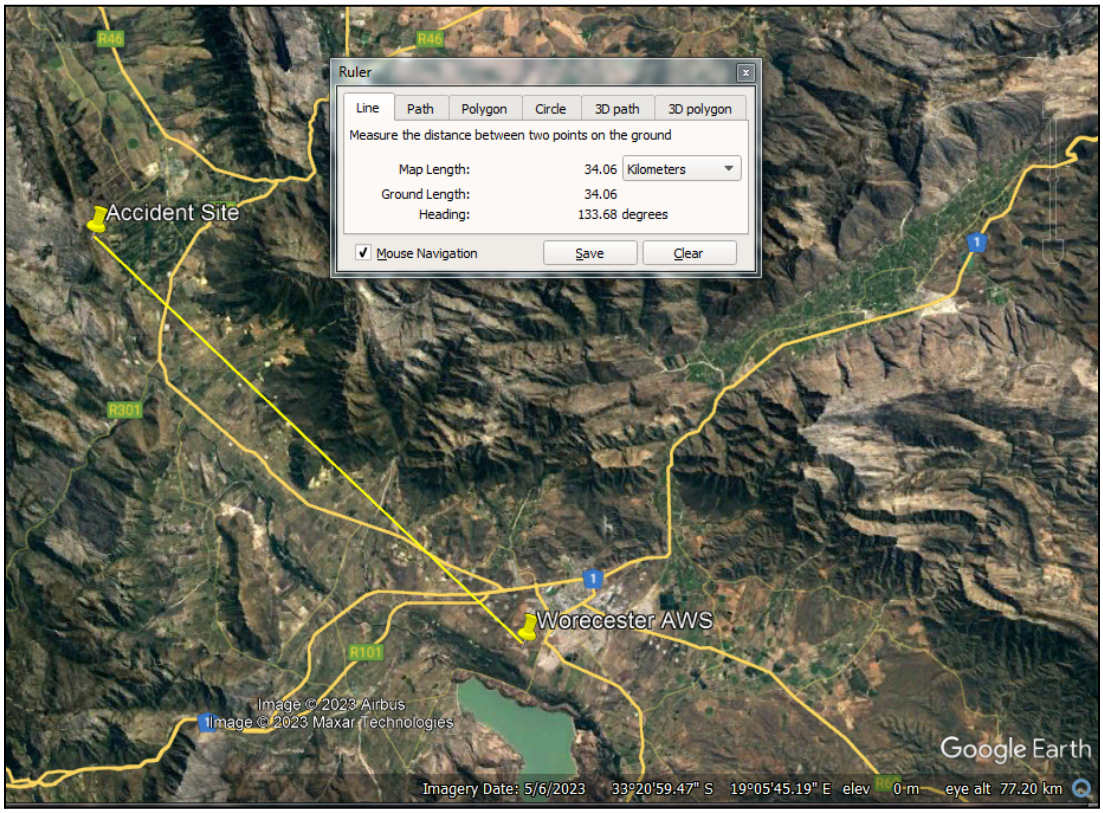


Figure 11: Location of Worcester weather station relative to the accident site. Map orientation north facing up.

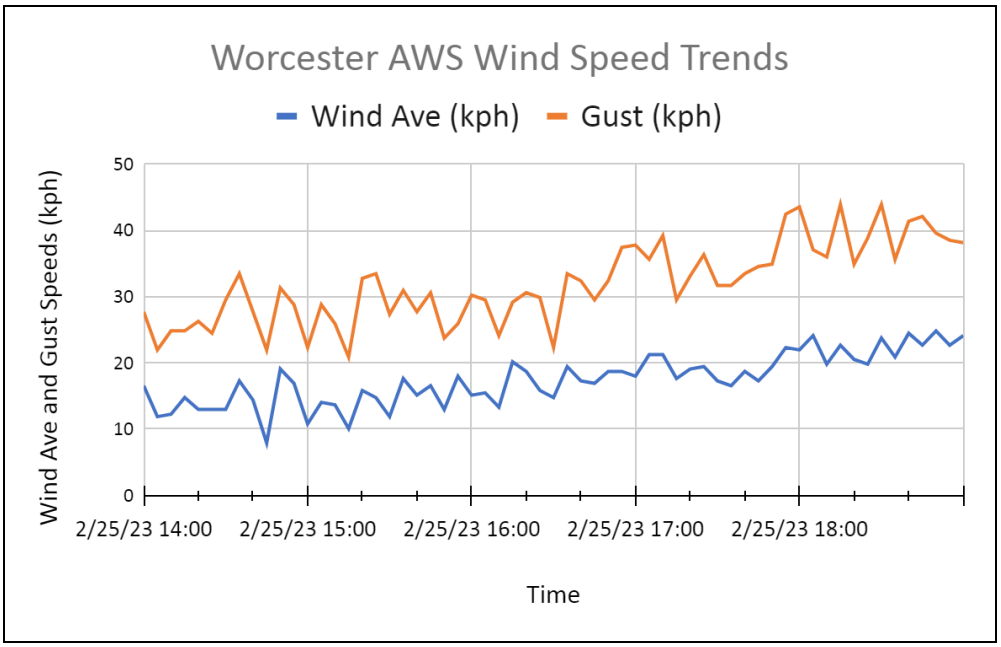


Figure 12: Worcester weather station wind speed over time

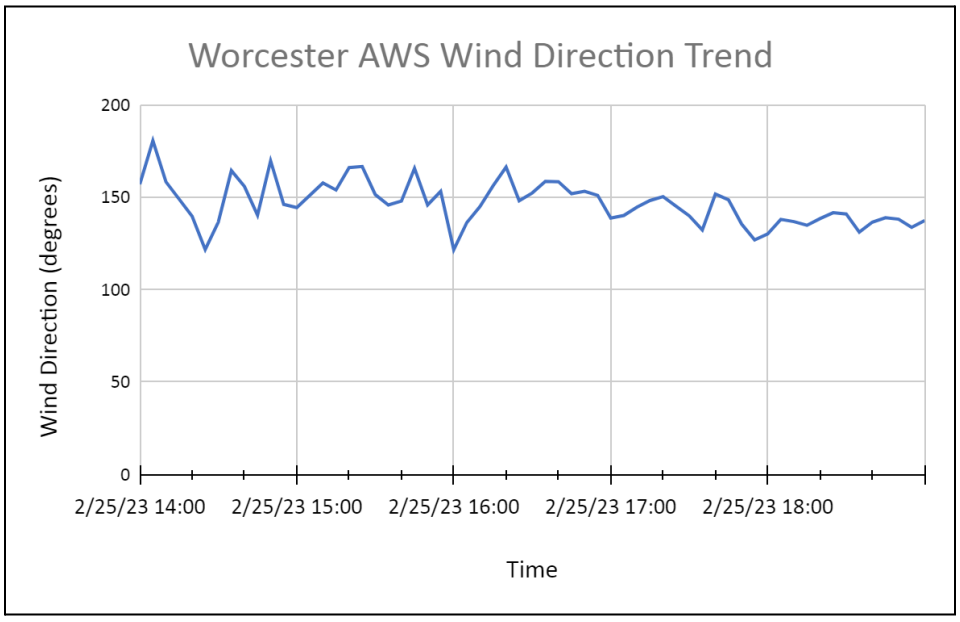


Figure 13: Worcester weather station wind direction over time

Noteworthy points:

1) The Worcester AWS readings show an increasing wind speed trend from 2 pm to 7 pm
2) The wind direction in Worcester throughout the afternoon was approximately SE (135 degrees) to SSE (157.5 degrees)

3) At 14h35 the average wind speed was 17kph whilst the gust speed was 33kph

1.6.3. Witness Statements

1.6.3.1. One of the pilots flying in the group of the three including the deceased pilot, reported l**anding after Slanghoek in wind speeds of approximately 30kph**. The time of landing was approximately 14h45, approximately the same as the time of the accident

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 would have been used which resulted in the IGC (paragliding tracklog type format) tracklog that is available.

1.8. Communication

1.8.1. VHF Radio:

There are no records of the pilot making use of a VHF radio as is commonly used in the paragliding fraternity.

1.8.2. Mobile device

The pilot had on board with him a mobile device. Attempts by witnesses (pilots in the same retrieve vehicle) to call the pilot were unsuccessful.

1.8.3. WhatsApp live location:

1.8.3.1. Witness statements from the paragliding pilots who flew in the same group with the deceased pilot, state that WhatsApp Live Location tracking was used to track each other's flights as well as to enable the retrieve driver to follow the group of three pilots.

1.8.3.2. The WhatsApp live location feature shows the GPS position of the mobile device i.e. the position on the map in terms of latitude and longitude coordinate data.

1.8.3.3. The first pilot in the group to land did so at approximately 14h45 (about the time of the accident) in the Slanghoek Valley (approximately 20km south of the accident site). This pilot was picked up by the retrieve driver. The first pilot notes that whilst tracking the two remaining pilots from the group (including the deceased) they **did not realise that the deceased pilot's location had not changed**. It was only after the second pilot from the group landed (16h04) and packed up, that attention was paid to the live location of the deceased.

1.9. Aerodrome information

The flight started from the Rusty Gate takeoff site (34°1.928′S 19°21.968′E). Further information on this takeoff site is unnecessary given that the accident occurred several hours later and approximately 70km away.

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

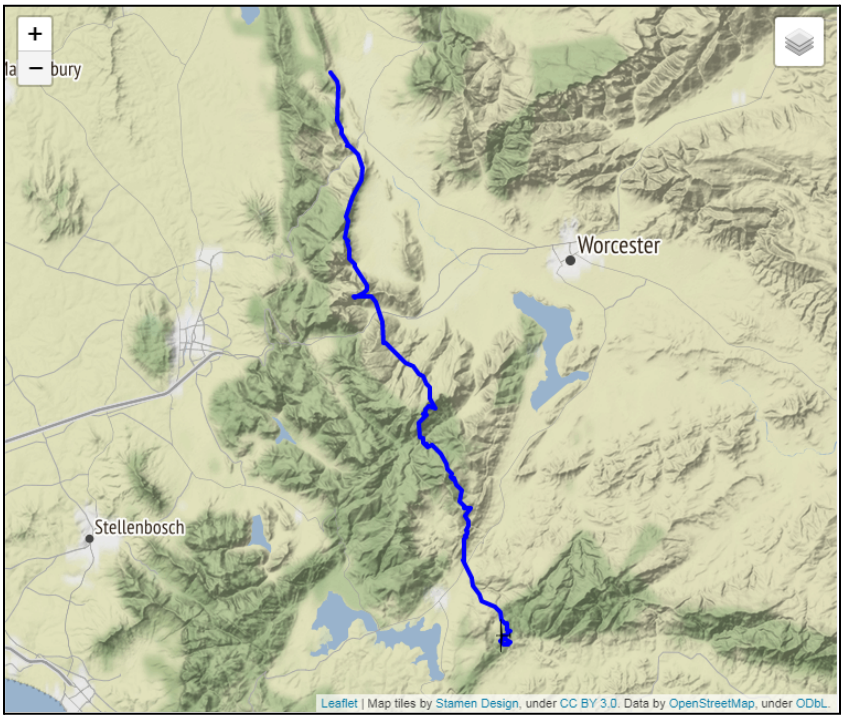


Figure 14: Overall flight path derived from the available tracklog. Map orientation north facing up.

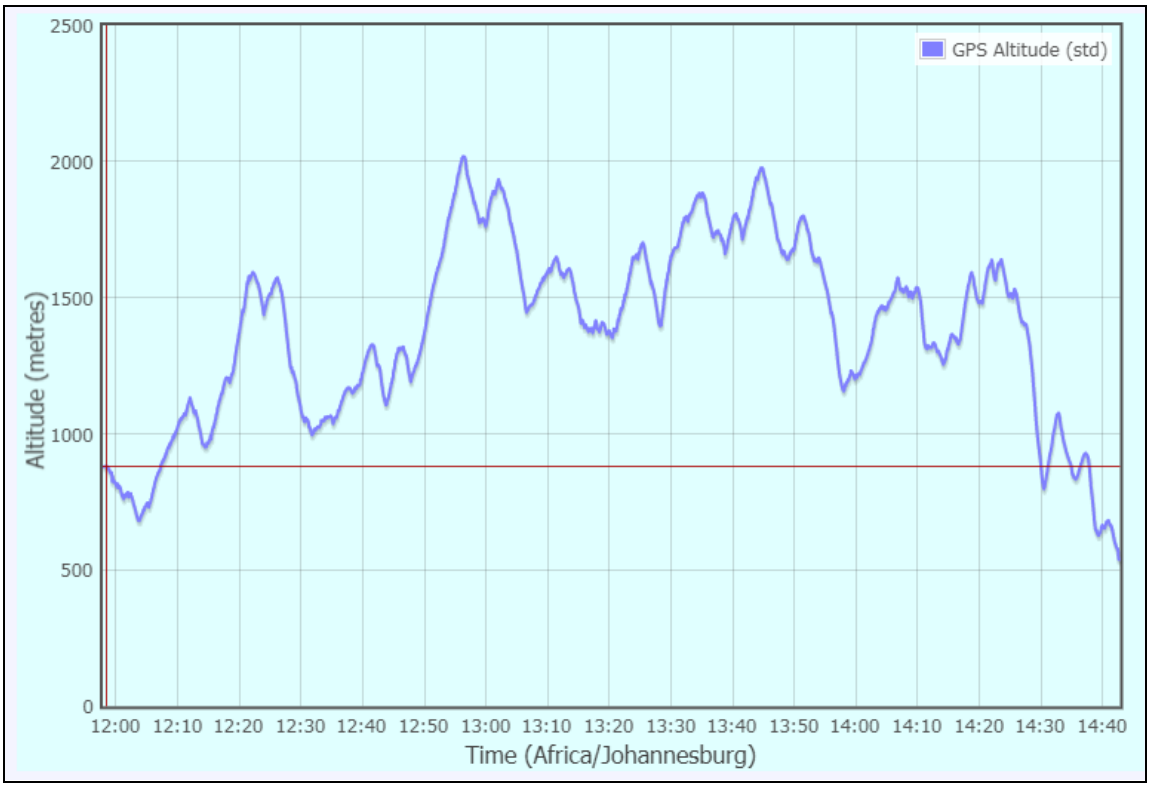


Figure 15: Flight altitudes over the duration of the flight

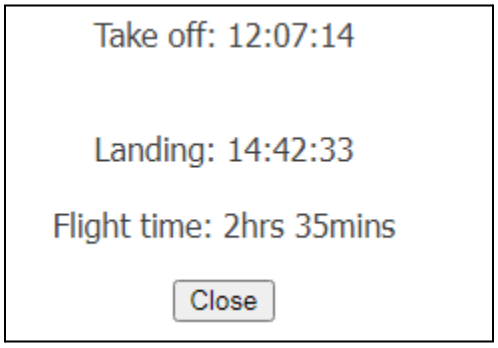


Figure 16: Tracklog flight summary

1.10.1.2. 2D View showing the last section of the flight. At 14:40:39 a GPS Speed of 89kph was recorded at 14h40 i.e. two minutes before the accident. It also shows that the pilot flew on NNW heading following the contour of the ridge. **The accident occurred on the downwind side of the ridge if the wind was coming from the south.**

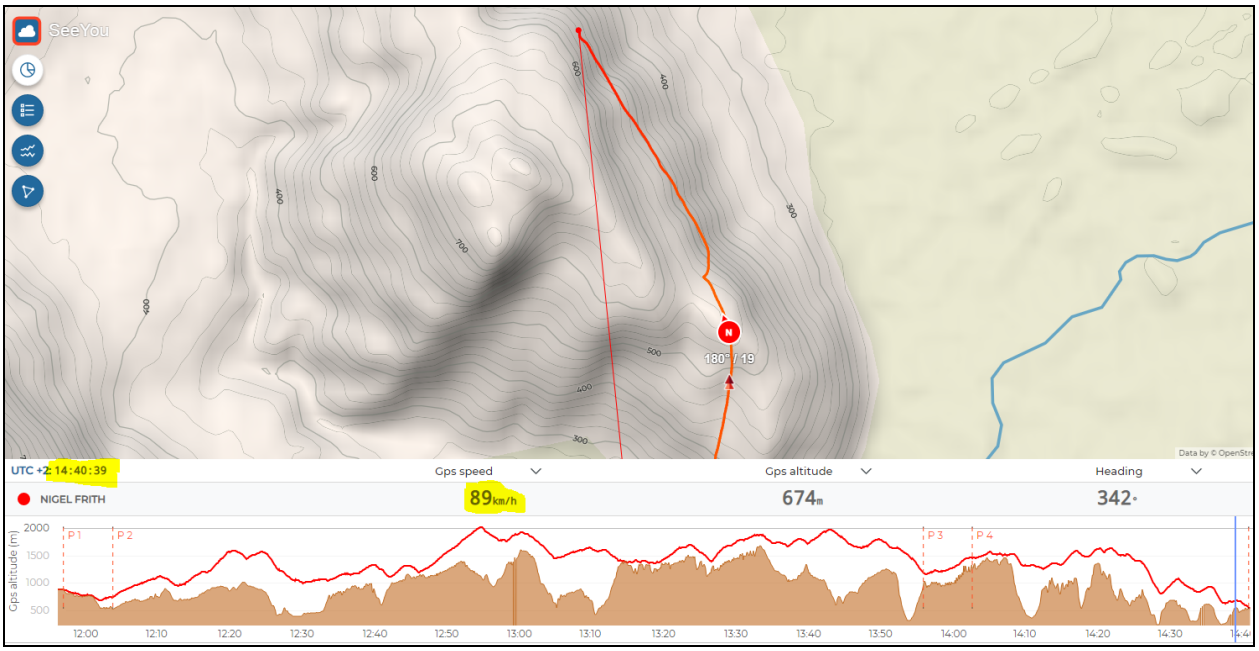


Figure 17: Final section of the flight leading to the accident. Map orientation north facing up.

1.10.1.3. 3D View showing the pilot flying along the ridge on which the accident took place. The snapshot is taken at 14:42:06, almost 30 seconds before the accident. The view shows that the pilot arrived at the corner of the ridge and then turned to follow a NNW heading along the contour of the ridge. It can be seen that the pilot was descending as he flew along the ridge.

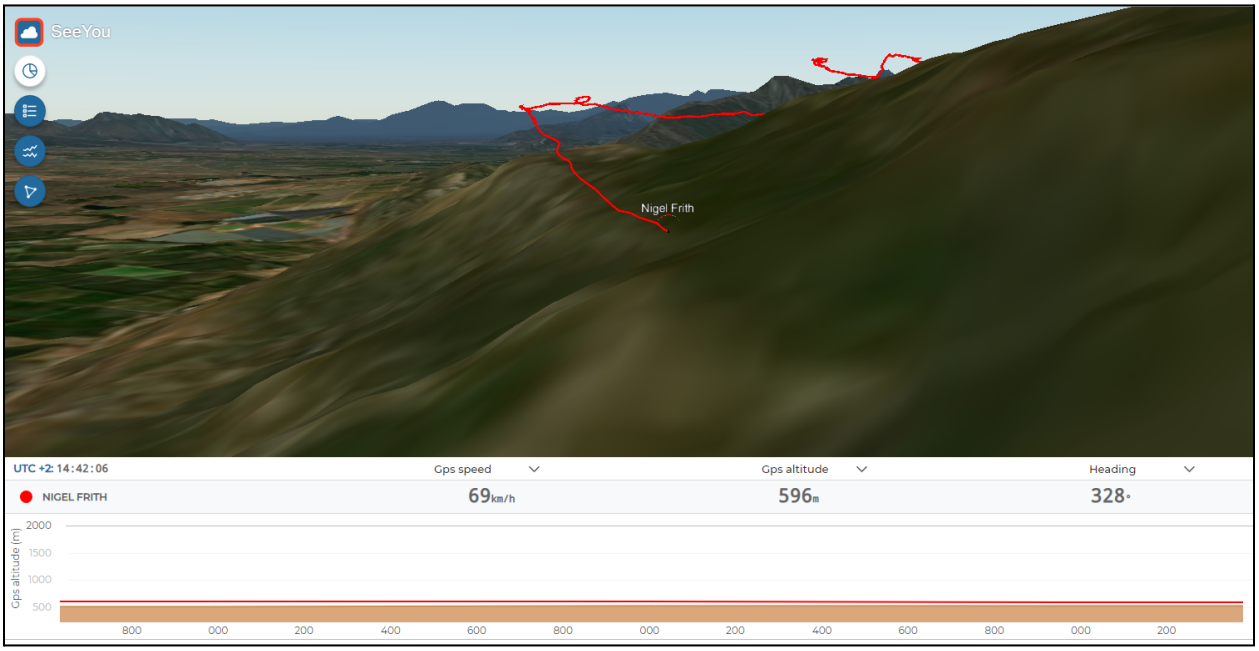


Figure 18: 3D view showing the flight path taken at ~30 seconds prior to the accident

1.10.1.4. Analysis of GPS Speed **for the last 30 seconds of flight. Speeds in excess of 70kph are regularly recorded**. Sharp drop off in speed to point of accident. NB. Each column on the graph represents one second.

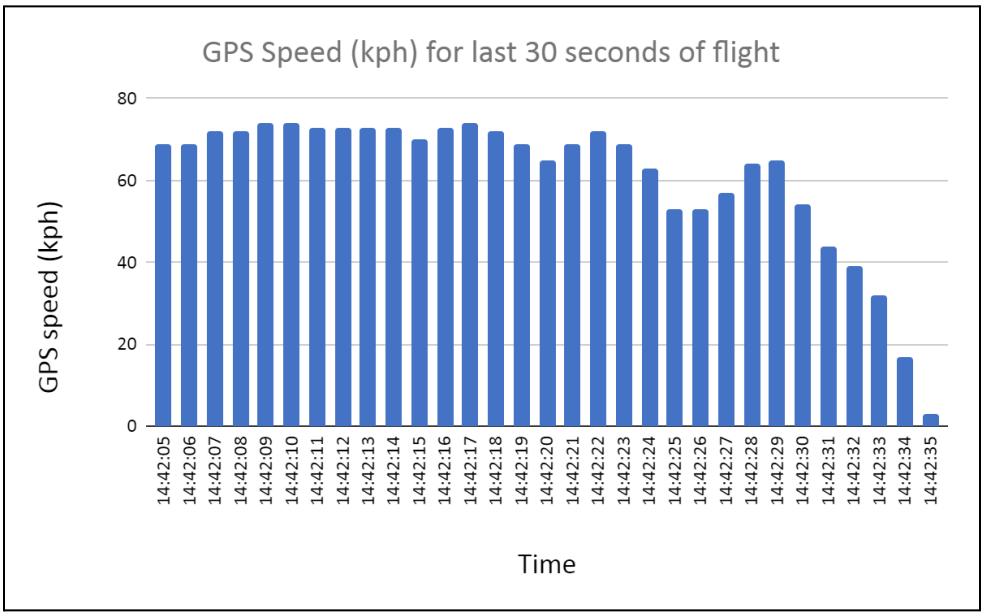


Figure 19: Tracklog derives GPS speed for the last 30 seconds of flight

1.10.1.5. Analysis of GPS altitude for the last 10 seconds of flight. The typical descent rate of a paraglider is 1m/s in still air. Paragliding rescue parachutes are tested to withstand landings of 5.5m/s. In the last 3 seconds before coming to a stop, the glider descended from an altitude of 567m to 541m. This equates to a drop of 26m over 3 seconds or an average descent of 8.7m/s. This is a **significantly high descent rate**. It also implies that the **pilot was relatively close to the terrain** when an occurrence caused the rapid loss of height which resulted in the accident.

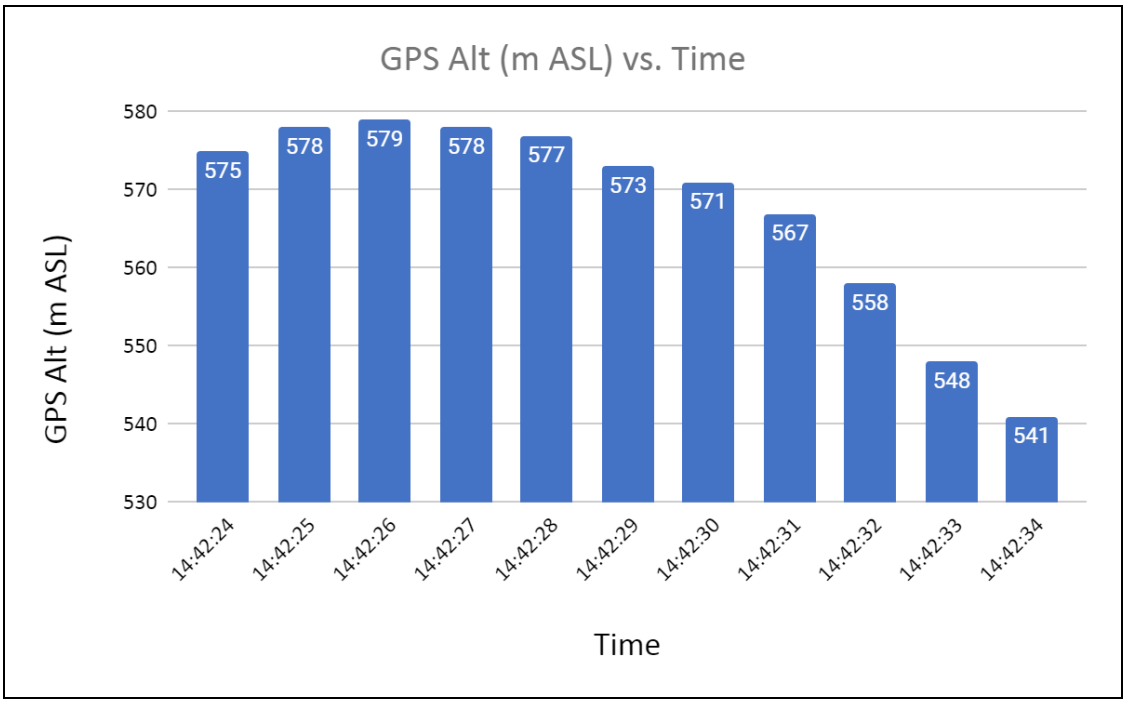


Figure 20: Tracklog derives GPS altitude for the last 10 seconds of flight. Rapid loss of altitude starts from 567m ASL. The accident occurred at 541m ASL.

1.11. Wreckage and Impact information

1.11.1. Location of the accident: 33°27.095′S 19°9.047′E

1.11.2. The terrain is mountainous and covered in fynbos with no easy access

1.11.3. Located west of farmhouses below

1.11.4. Witness statements indicate that the pilot was found lying unconscious on his left side with his head higher than his feet, facing in a northerly direction. There were no signs of bleeding and no broken bushes in the area.

1.11.5. Power lines in the vicinity, 300m away from the accident site at its closest point

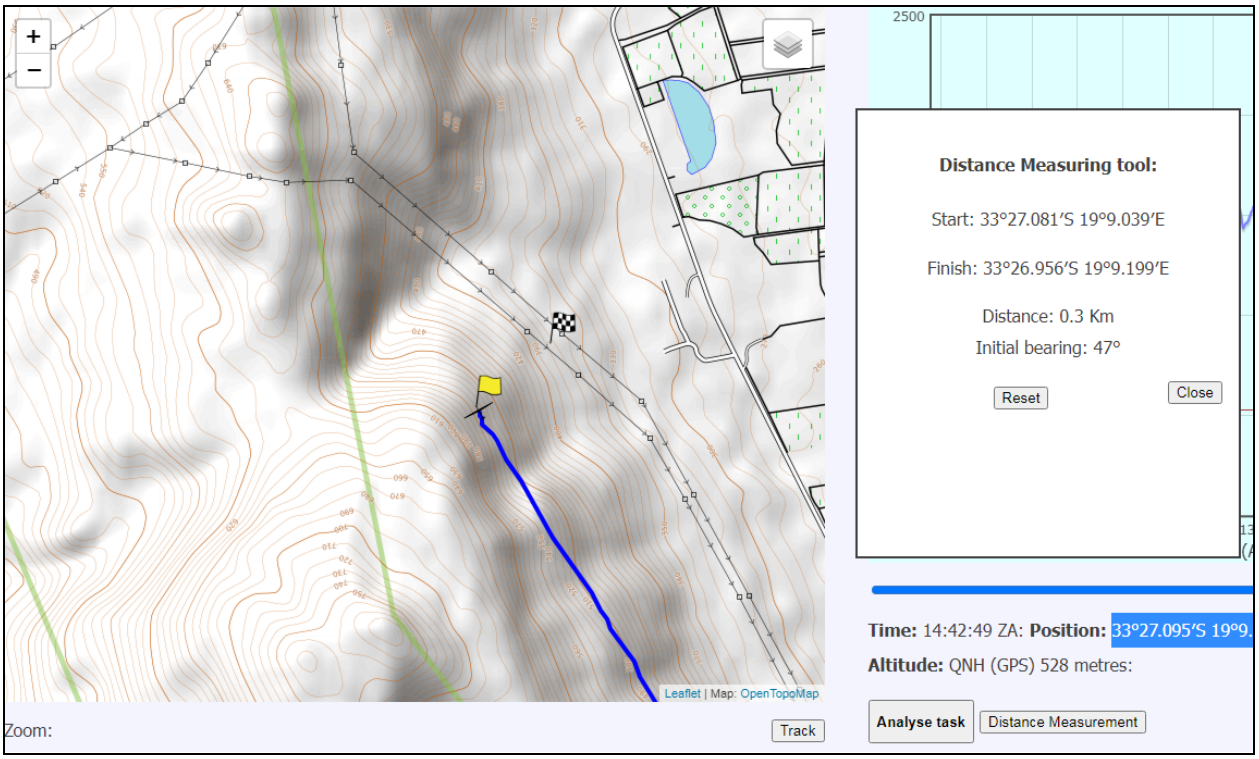


Figure 21: Accident location including power-line proximity (300m between flags diagram). Map orientation with north facing up.

1.12. Medical and Pathological Information

1.12.1. The conclusion from the chief autopsy findings states that the cause of death was "Chest wall injuries (Unnatural)"

1.12.2. Final toxicology test results are outstanding and to be added to the final report when available

1.13. Fire

1.13.1. Did not occur

1.14. Survival Aspects

1.14.1. The accident took place at 14h42. The pilot was unconscious but breathing without assistance until approximately 18h15, and then passed away from the injuries at approximately 19h00. This implies that the pilot was **alive for approximately four hours after the accident**. It could be speculated that had the pilot received medical treatment soon after the accident survival prospects could have been higher.

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:

1.15.2.1. Harness Inspection: Cleats holding the front of the seat board in place were set up asymmetrically

Figure 22: Harness setup showing leg straps asymmetry

1.15.2.2. Rescue parachute inspection

1.15.2.2.1. Rescue parachute: The Gin One G was found to be in serviceable condition, with relatively fresh elastics holding the lines together:

Figure 23: Rescue parachute lines

1.15.2.2.2. Rescue handle: The Rescue handle pins were found to be in position on the harness, with the Rescue parachute requiring no more than 650g force to extract the Rescue from the container

Figure 24: Rescue handle in position

1.15.2.3. Wing inspection:

1.15.2.3.1. Visual inspection shows that the fabric was severely discoloured

1.15.2.3.2. The condition of the lines was found to be visually in average condition

1.15.2.3.3. Line length check: overall line set is 31mm shorter than the manufacturer's specification, which is in the tolerance allowed by the manufacturer (+-50mm offset).

1.15.2.3.4. There is an asymmetry of 74mm on the brake lines i.e. one brake line is 74mm longer than the other.

1.15.2.3.5. The breaking strength of the lines is deemed to be around 58% of the original design strength.

1.15.2.3.6. Fabric porosity tests: **the top surface fails due to the reading at one of the locations being <19 seconds**. The bottom surface was not measurable, as the air passed through the porosity meter faster than the meter could be set up indicating that the fabric on the bottom surface is completely porous.

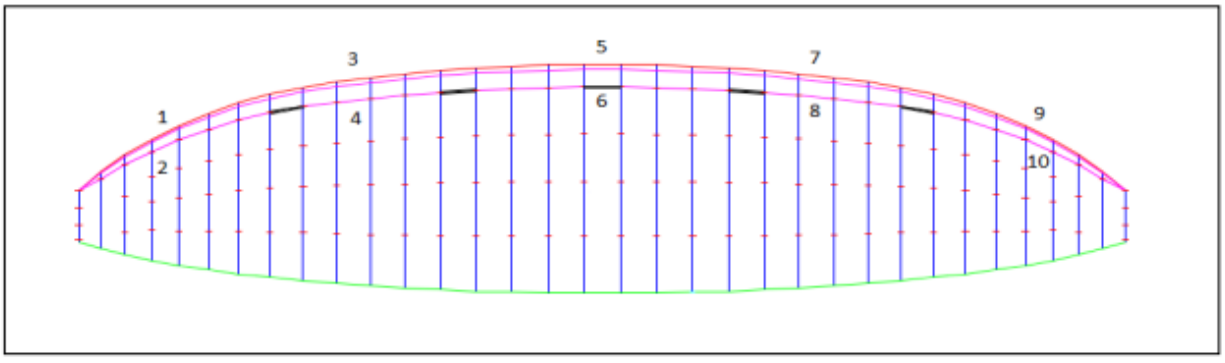


Figure 25: Porosity test locations

1	3	5	7	9	
45.1	27.7	24.8	44.9	17.7	sec
2	**4**	**6**	**8**	**10**	
0.2	0.2	0.2	0.2	0.2	sec

Figure 26: Porosity test values

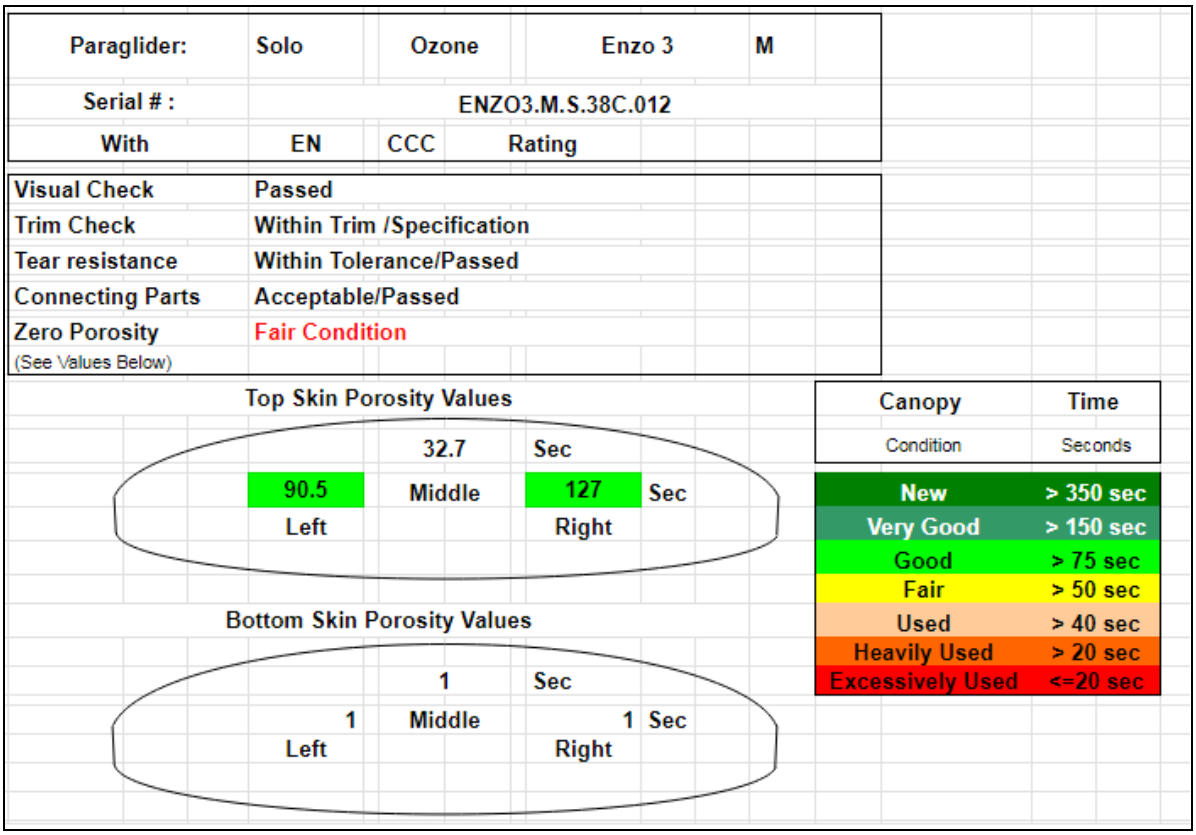
1.15.2.3.7. Fabric strength tests performed on the wing failed on the first test in the weave direction so no second tests in the weft direction were done.

Test location	Failure strength	% failure
Top surface	26 lbs	65%
Bottom surface	13 lbs	33%

1.16. Organisational and Management Information

1.16.1. The paragliding aircraft was operated privately under the provision of Part 94 of the Civil Aviation Regulations 2011.

1.16.2. Last service: The glider was serviced on the 29th of September 2022. The results of the last service show the glider to be airworthy



Paraglider:	Solo	Ozone	Enzo 3	M
Serial # :	ENZO3.M.S.38C.012			
With	EN	CCC	Rating	

Visual Check	Passed
Trim Check	Within Trim /Specification
Tear resistance	Within Tolerance/Passed
Connecting Parts	Acceptable/Passed
Zero Porosity (See Values Below)	Fair Condition

Canopy Condition	Time Seconds
New	> 350 sec
Very Good	> 150 sec
Good	> 75 sec
Fair	> 50 sec
Used	> 40 sec
Heavily Used	> 20 sec
Excessively Used	<=20 sec

Figure 27: Snapshot of summary of last service report

1.16.3. **Additional work post the last service:** On the 18th of February 2023 the pilot contacted a local service provider requesting the replacement of broken lines on the glider. According to the WhatsApp conversation history provided, the pilot stated that lines had broken mid-flight. The service provider replaced selected lines on the 22nd of February 2023. The service provider also recommended a full-line replacement. The pilot's responses indicated that he was not in a financial position to do so and that he intended to retire this wing in the near future. "*I aim to look for a replacement glider some time soonish ..before I really need a new line set.. I will decommission that wing*"

1.16.4. **SAHPA and SACAA investigation into November 2022 tandem flying incident**: The pilot was one of several tandem instructors in the middle of a disciplinary process due to flying in adverse weather conditions several months prior. Disciplinary letters were issued by SAHPA on the 28th of February 2023 (3 days after the accident)

1.17. Additional information

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

1.17.2. Timeline of events extracted from witness statements and information provided by the ARCC. NB. *Times extracted from witness statements should be taken as approximations as there is no confirmation that exact times were recorded*

- *12h07 Takeoff*
- *14h42 Accident*
- *16h10 Witnesses spot something on the mountain in the location of the pilots' WhatsApp live location - at this point, witnesses are unsure if it's a glider or piece of plastic in bushes*
- *16h16 Witnesses start hiking to investigate*
- *17h00 First witness on site of accident. The pilot is unconscious but breathing*
- *17h13 ARCC alerted to the incident. The ARCC activated Metro EMS who sent out their rescue manager*
- *17h38 Metro EMS arrived at the bottom of the mountain. Requested additional support from Mountain Rescue.*
- *17h47 After weather assessments Skymed Helicopter stood down - unable to fly due to wind strength outside their operational scope*
- *17h48 SAPS Airwing advised they would also not be available as the conditions were outside the operating conditions*
- *17h50 SAAF was contacted but no aircraft were available in the province to assist. Kushigu Aviation (Working on Fire contractor) contacted, and they advised that they had a UH60 and Huey available. Due to conditions only the UH60 was able to assist.*
- *18h15 Pilot stops breathing, and CPR is started by a witness on scene*
- *18h30 UH60 departed with a paramedic onboard*
- *18h57 UH60 landed at the staging area. The UH60 lifted from the staging area to the patient with rescue personnel landing at the patient at 19h03.*
- *19h17 Pilot declared deceased*

1.17.3. Comments were sought from the manufacturer of the glider on the porosity of the glider as well as pilot requirements to fly such a glider. The following is the response from the manufacturer "*we make it clear that the Enzo3 is only suitable for experienced world class competition / XC pilots* ***with recent and current SIV training.*** *Looking at the porosity numbers,* ***the top surface is in acceptable condition****, however the lower surface is below the industry accepted minimum of 10 Seconds.* ***We could only deem this wing as non-airworthy although it will be hard for you to determine whether the low porosity was a contributing factor. From experience, wings with similar porosity values generally fly correctly****.*"

2. Findings

2.1. Pilot Skills

2.1.1. The pilot is considered to be of a suitable experience level to fly the model of glider chosen. He was a regular participant in the annual Porterville paragliding competition and had been flying gliders of this level performance for many years.

2.1.2. The lack of a pilot logbook did not enable this investigation to ascertain the frequency of flights undertaken prior to the accident. It was also not possible to determine when last the pilot had undertaken SIV training.

2.2. Weather

2.2.1. Analysis of the forecasts, the actuals from the Worcester AWS, witness statements and the GPS speeds from the pilot all point to strong wind at the accident location.

2.2.2. Wind direction forecast for the area of the accident, as well as that derived from the pilot's flight app on his mobile device, indicate a southerly wind direction (180 deg, 19 kph)

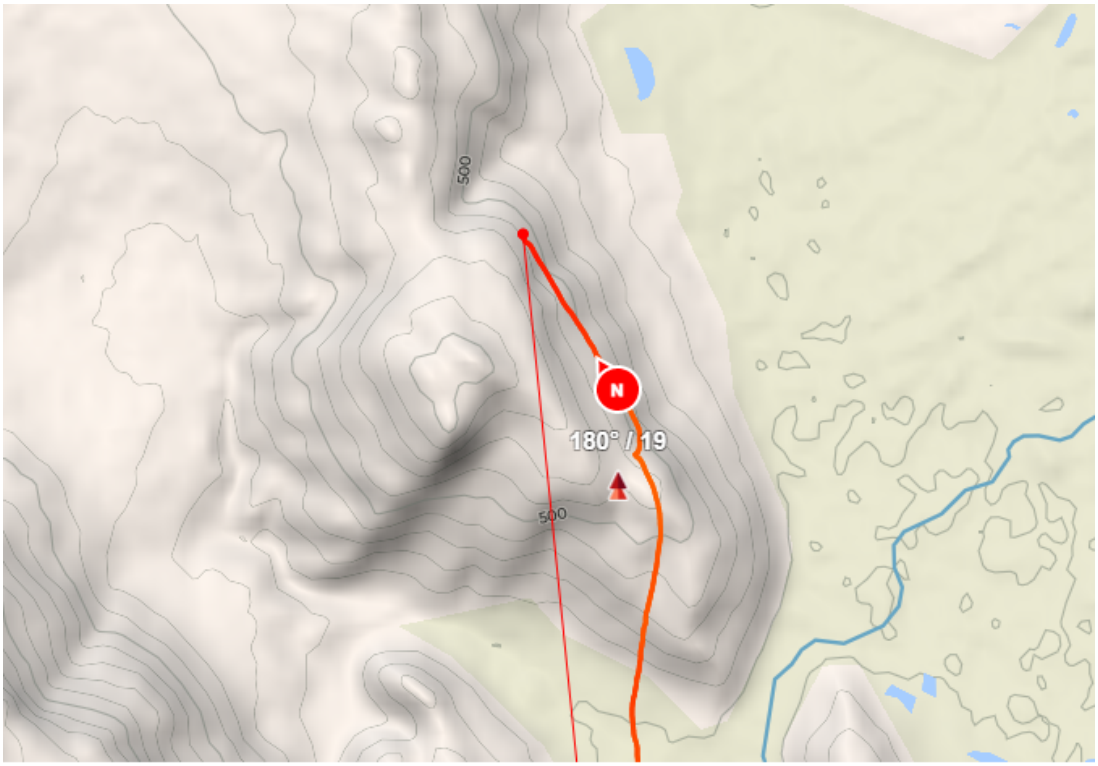


Figure 28: Screenshot of tracklog showing topography and wind calculations derived from the IGC tracklog (analysed using SeeYou software). Map orientation north facing up.

2.2.3. Turbulence

Given the significant loss of height (ASL) in the last few seconds of the flight is reasonable to conclude that a turbulence-related event caused a lack of control ultimately ending up with the pilot impacting the mountain whilst still in a flying position. It is likely that the pilot

attempted to solve whatever issue he had up until impact. There are no indications that the pilot attempted to deploy his rescue parachute which implies that he was focused on flying/fixing the glider.

2.2.3.1. Mechanical leeward side rotor

Analysing the wind speed, direction and topography of the terrain it is **quite likely that the main cause of the accident was the rotor (mechanical turbulence)** created from the southern end of the mountain flowing down the northeast-facing ridge on which the accident occurred.

2.2.3.2. Thermal turbulence

There is a smaller chance that the turbulence encountered by the pilot was created by a strong thermal. This thermal could have been one that triggered off the south-facing ridge, or a lee-side thermal that triggered inside the gulley on the north side of the accident scene, or a thermal triggered from the power lines below.

2.3. Rescue Deployment and Height AGL

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

2.3.2. The rapid loss of altitude (see Fig. 20) starts at 567m ASL. The accident occurred at 541m ASL. This equates to a loss of 26m before impact. Flying at this height above ground level would be considered **low above the terrain**. It is unlikely that there was sufficient time for the pilot to safely deploy his rescue parachute.

2.4. Equipment

2.4.1. The pilot's harness was set up asymmetrically - this could have had a negative impact on his control of the craft when he encountered turbulence. However, it should be noted that it is unknown whether the asymmetrical setup was changed during or after the accident.

2.4.2. **The left and right brake line lengths differed significantly (74mm)** - this asymmetrical setup could have had a negative impact on his control of the craft when he encountered turbulence.

2.4.3. The post-accident service report indicates that the porosity of the glider failed due to the 17.7 seconds porosity reading on the top right surface of the wing. **However, comments received from the manufacturer indicate that the porosity is unlikely to be a significant contributing factor to the accident.**

2.5. Response Time and Communication

2.5.1. Time before the pilot was found:

The first witnesses were on site around 2 hours and 15 minutes after the accident occurred. It was only after the witnesses arrived on site that emergency services were requested. This means that there was a **significant delay before anyone realised that an accident**

had taken place. The use of the WhatsApp Live Location feature did little to alert the rest of the pilot's group that an accident might have taken place.

2.5.2. Time for medics to arrive:

The **time for medical assistance was hampered by the location of the accident being on a mountain slope**. Helicopter assistance was required to get to the accident scene. **Significantly strong winds prevented both the local Skymed as well as the police services helicopters from flying**. The SAAF had no aircraft available at the time of the accident. A private contractor provided rescue services, which reached the pilot around 4 hours after the accident took place.

2.5.3. Communication with Emergency Services:

Feedback from the ARCC indicates that they were not immediately notified of the change in the pilots' health status i.e. that the pilot had stopped breathing and CPR initiated. It is unlikely that this lack of notification played a significant role in the outcome of the event.

3. Ongoing Investigations

Final pathology report to be included upon receipt.

4. Recommendations

4.1. Logbooks

4.1.1. It is recommended that SAHPA investigate a suitable mechanism to collect pilot logbook information on a more frequent basis than the 2-year renewal period.

4.2. SIV Training

4.2.1. It is recommended that SAHPA remind pilots, especially those flying high-performance gliders, of the benefits of SIV training.

4.3. Weather considerations

4.3.1. It is recommended that SAHPA remind pilots of the dangers of flying in strong wind. These dangers include both the immediate danger of rotor turbulence, as well as possible delays of medical assistance due to inclement weather hindering rescue efforts, especially in difficult-to-access terrain.

4.4. Equipment setup

4.4.1. It is recommended that SAHPA educate its pilots on the basics of equipment maintenance including the dangers of asymmetrical setups.

4.5. Live tracking

4.5.1. It is recommended that SAHPA educate its pilots on the benefits of live tracking with services that can provide more information than just a two-dimensional position on a map. WhatsApp live location sharing should be discouraged as the only means to track pilot activity.

4.6. Emergency response protocol

4.6.1. It is recommended that SAHPA educate its pilots on best practices in terms of medical emergencies including communication protocol with the ARCC.