PARAGLIDER ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9798	
Paraglider Registration	**N/A**	**Date of Accident**	18 June 2019		**Time of Accident**	0844Z
Type of Paraglider	Gin Atlas XL		**Type of Operation**		Private (Part 105)	
Pilot-in-command Licence Type	Paraglider		**Age**	52	**Licence Valid**	Yes
Pilot-in-command Flying Experience	Total Flying Hours		31.7		Hours on Type	31.7
Last Point of Departure	God's Window paragliding launch, Ehlanzeni, Mpumalanga Province (S24°54'24", E030°51'58")					
Next Point of Intended Landing	God's Window paragliding launch, Ehlanzeni, Mpumalanga Province					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
At GPS Co-ordinates: S24˚51'21", E030˚53'24" near God's Window, Ehlanzeni						
Meteorological Information	Wind: 150˚/6-10 kts (gusting 18kts), Temperature: 25˚C, Visibility: CAVOK.					
Damage to Paraglider	None					
Number of People On-board	1	**No. of People Injured**	0	**No. of People Killed**	1	
Synopsis						

On Tuesday, 18 June 2019 at 0844Z, a paraglider pilot launched the paraglider near God's Window in moderate to strong wind conditions. The accident paraglider pilot flew north along the ridge in a linear distance of approximately 6.5 kilometres (km). The paraglider pilot encountered turbulence which induced a wing collapse whilst descending towards the bottom of the mountain (on the escarpment side); and the paraglider entered into a fast spiral. It was noted from the pilot's flight instrument that the paraglider drifted back over the escarpment approximately 1.5km and was descending at a rate of -16.4 metres per second (m/s), which is -11.4m/s faster than the recommended speed of 5m/s.

The pilot managed to extricate the reserve parachute, but it did not deploy. The paraglider was seen descending to the ground by witnesses who, when they got to the accident site, found the pilot fatally injured. The paraglider was not damaged during the accident sequence.

Probable Cause/s and/or Contributory Factors

The paraglider encountered turbulence whilst being flown along the mountain ridge which resulted in the canopy collapsing and the glider entering a spiral. The glider descended at a rate of -16.4m/s which was -11.4 m/s faster than the allowed descent rate of 5m/s.

Contributing Factors:

The pilot did not deploy the reserve parachute at the correct or safe altitude.

SRP Date	16 February 2021	Publication Date	22 February 2021

ABBREVIATION	DESCRIPTION
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AMSL	Above Mean Sea Level
CAR	Civil Aviation Regulations
CAVOK	Ceiling and Visibility OK
C of R	Certificate of Registration
E	East
ft	Feet
GPS	Global Positioning System
kt	Knots
SACAA	South African Civil Aviation Authority
SAHPA	South Africa Hang Gliding and Paragliding Association
SAWS	South African Weather Service
UTC	Co-ordinated Universal Time Denoted by Z
Z	Zulu (Universal Co-ordinated Time)

Name of Owner/Operator	: Not Applicable
Manufacturer	: Gin Paragliders
Model	: Gin Atlas XL
Nationality	: South African
Registration Marks	: None
Place	: God's Window at GPS: S26°19.864, E028°32.460
Date	: 18 June 2019
Time	: 0844Z

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 of the Investigation:

In terms of Regulation 12.03.1 of the Civil Aviation Regulations (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 to apportion blame or liability****.*

Investigation Process:

The accident was reported to the Accident and Incident Investigations Division (AIID) on 18 June 2019 at about 1230Z. The AIID did not dispatch an investigator to the scene of the accident.

The AIID had appointed an expert from the South African Hang Gliding and Paraglider Association (SAHPA) to conduct an on-site investigation and to compile this report under AIID investigator-in-changed (IIC). The factual information was obtained from the standard SAHPA accident and incident report.

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

- *Accident – this investigated paraglider accident*
- *Paraglider – Gin Atlas XL paraglider*
- *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 be adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report are limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows or lines.

Disclaimer:

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 On Tuesday, 18 June 2019 at 0844Z, a paraglider pilot launched the paraglider near God's Window in Mpumalanga province in moderate to strong wind conditions. The paraglider flew north along the ridge in a linear distance of approximately 6.5 kilometres (km). The accident paraglider encountered turbulence which induced a wing collapse whilst descending towards the bottom of the mountain (on the escarpment side); thereafter the paraglider went into a fast spiral. It was noted from the paraglider's flight instrument that it drifted back over the escarpment approximately 1.5km.

1.1.2 God's Window is characterised by a high cliff face with a plateau, facing primarily south-east. The tracklog of the flight is shown in Figure 1 and Figure 2. The straight-line distance from the launch site to the impact site is 6.14km (Figure 1). The distance from the impact site to the cliff is 1.5km in south south-east (SSE) direction (Figure 2).

Figure 1: Straight-line in yellow shows flight distance, and the red line shows flight path. (Source: SAHPA)

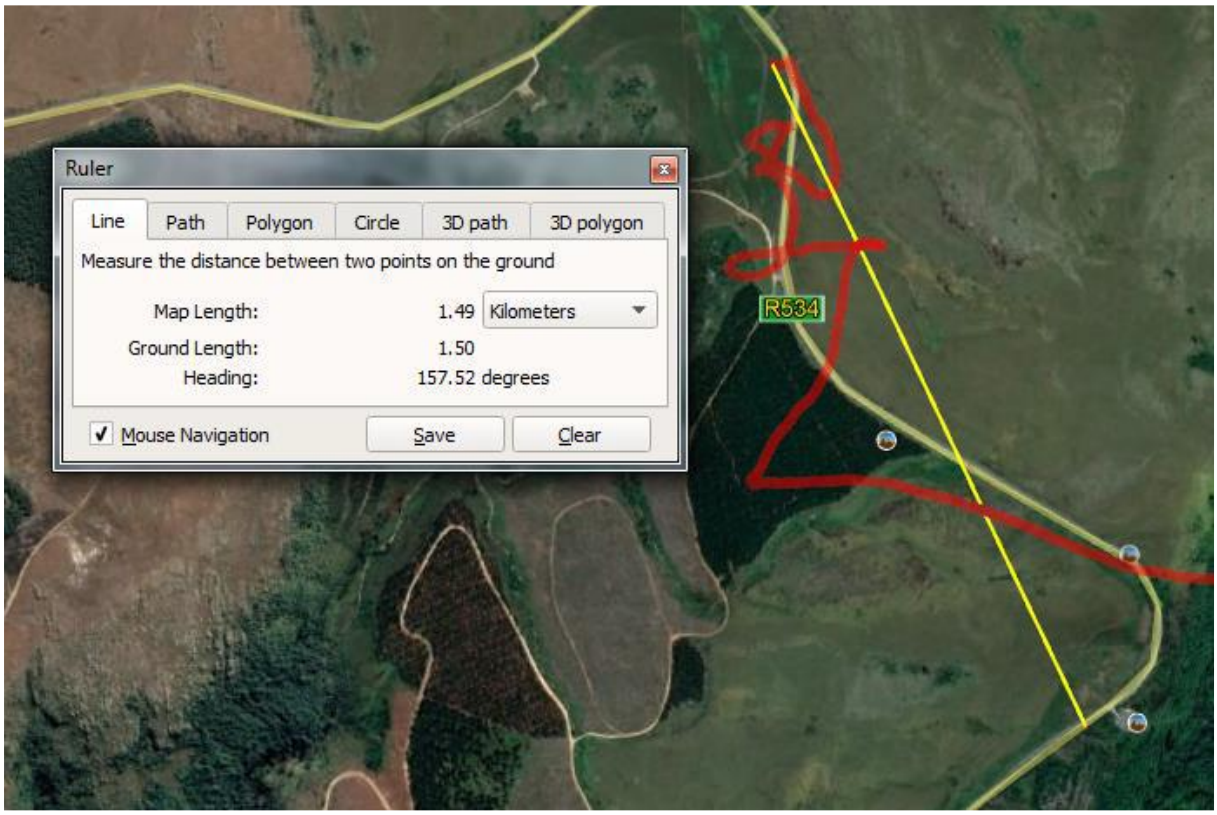

Figure 2: Distance of impact site from launch to the edge of the cliff in a wind direction of 157.5 degrees (SSE). (Source: SAHPA)

1.1.3 The paraglider was seen descending to the ground by witnesses who, upon reaching the accident site, found the pilot fatally injured. The paraglider was not damaged during the accident sequence.

1.1.4 The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be S24˚51'21" E030˚53'24" at an elevation of 1478ft above mean sea level (AMSL).

Figure 3: The aerial view of the accident site. (Source: Google Earth).

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Total On-board	Other on Ground
Fatal	1	-	-	1	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	-	-	-	-	-
Total	1	-	-	1	-

1.3 Damage to Paraglider

1.3.1 The paraglider was not damaged during the accident sequence.

Figure 4: No damage to the paraglider. (Source: SAHPA)

1.4 Other Damage

1.4.1 None.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	52
Licence Number	0279034201	Licence Type	Paraglider		
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	Self-declared				
Weight of pilot	70kg				
Restrictions	Nil				
Previous Accidents	None				

1.5.1 The pilot was initially issued a National Pilot Licence (NPL) on 18 April 2016, and the renewal was issued on 2 July 2018; the last skills test was carried out on 31 July 2018 with an expiry date of 31 July 2019. The pilot was in possession of a self-declaration medical certificate issued on 2 July 2018 as per Part 62.01.10 of the Civil Aviation Regulations (CAR) 2011 as amended.

1.5.2 CAR 2011 Part 62.01.10 states:

(2) *Notwithstanding the provisions of Subregulation (1), where a national pilot licence is (to be) endorsed only for the category hang-glider or paraglider, its holder shall complete and submit instead a medical fitness certificate, as prescribed in Document SA-CATS 62.*

1.5.3 SACATS 62.01.10

Medical Fitness

1. *Format for personal medical fitness certificate*

(1) Personal declaration:

A medical fitness certificate to be submitted by the applicant for or the holder of a national pilot licence in terms of CAR 62.01.10(2) shall be on form APPENDIX R62.22.

1.5.4 According to information submitted by the South African Hang Gliding and Paragliding Association (SAHPA), the paraglider pilot had been flying paragliders since 2015. The paraglider pilot had first completed standard training in respect of the paragliders' syllabus before he was issued a Private Pilot Licence. He then logged a total of approximately 150 flights (launches) and accumulated approximately 31.7 hours of flight time on the paraglider. Within the past 90 days, the pilot had accumulated approximately 5 hours flying the paraglider.

1.6 Paraglider Information

Type	Paraglider ENB
Serial Number	BD01-Q6101136D
Manufacturer	Gin Paragliders
Model	Gin Atlas XL
Size	XL
Colour	Orange/White/Petrol
Weight Range	85 – 125kg
Inspection Date	1 July 2019

1.6.1 An inspection was carried out on the paraglider and its equipment on 1 July 2019, and it was found to be in a serviceable condition.

Harness:

Type	Pod
Manufacturer	Gin Genie
Model	Genie II (2)

Figure 5: A harness, paraglider and reserve parachute which were not fully deployed. (Source: SAHPA)

1.6.2 There was no documented evidence found which could give an indication as to when the reserve parachute was last packed or inspected. During the on-site investigation, proof was found indicating that the reserve parachute was extricated, which also indicated that the paraglider pilot had deployed the reserve parachute. The reserve parachute (Beamer 38) was found outside the harness and without the deployment nappy and reserve handle. There was no damage to the reserve parachute.

Reserve Parachute:

Manufacturer	Beamer 38
Serial Number	406142
Production Date	Unknown

Figure 6: The reserve parachute at the accident site. (Source: SAHPA)

1.7 Meteorological Information

1.7.1 The weather information below was obtained from the South African Weather Service (SAWS) at O.R. Tambo International Aerodrome.

Wind direction	150°	Wind speed	6-10 knots (gusting 18kts)	Visibility	CAVOK
Temperature	25°C	Cloud cover	Nil	Cloud base	Nil
Dew point	Unknown				

1.8 Aids to Navigation

1.8.1 The paraglider pilot had a Variometer instrument with him during the flight.

Figure 7: The Variometer instrument. (Source: SAHPA)

1.9 Communication

1.9.1 The paraglider pilot had no radio communication but was in possession of a cellular telephone.

1.10 Jump/Landing Site

1.10.1 The paraglider was involved in the accident outside the boundaries of an aerodrome. The accident site is an open field near the R534 Road.

1.10.2 The location of the accident site is at GPS co-ordinates S24˚51'21" E030˚53'24" at a field elevation of 1478 feet AMSL.

1.11 Flight Recorders

1.11.1 Not applicable.

1.12 Wreckage and Impact Information

1.12.1 The on-site investigation was conducted by SAHPA expert as designated by Executive-AIID. The expert was assisted by the AIID IIC. The paraglider was inspected during the on-site investigation process. The interpretation of the paraglider and ground impact information were then later compared with the information found on the Variometer instrument. According to the Variometer instrument, the following were observed:

1.12.2 The 3-dimensional flight path of the time of the accident is shown in Figure 8. The pink shade represents a sink rate of 14.1 m/s at an altitude of 232m above ground level (AGL). A maximum sink rate of -16.4 m/s occurs 2 seconds before impact at an altitude of 23m AGL.

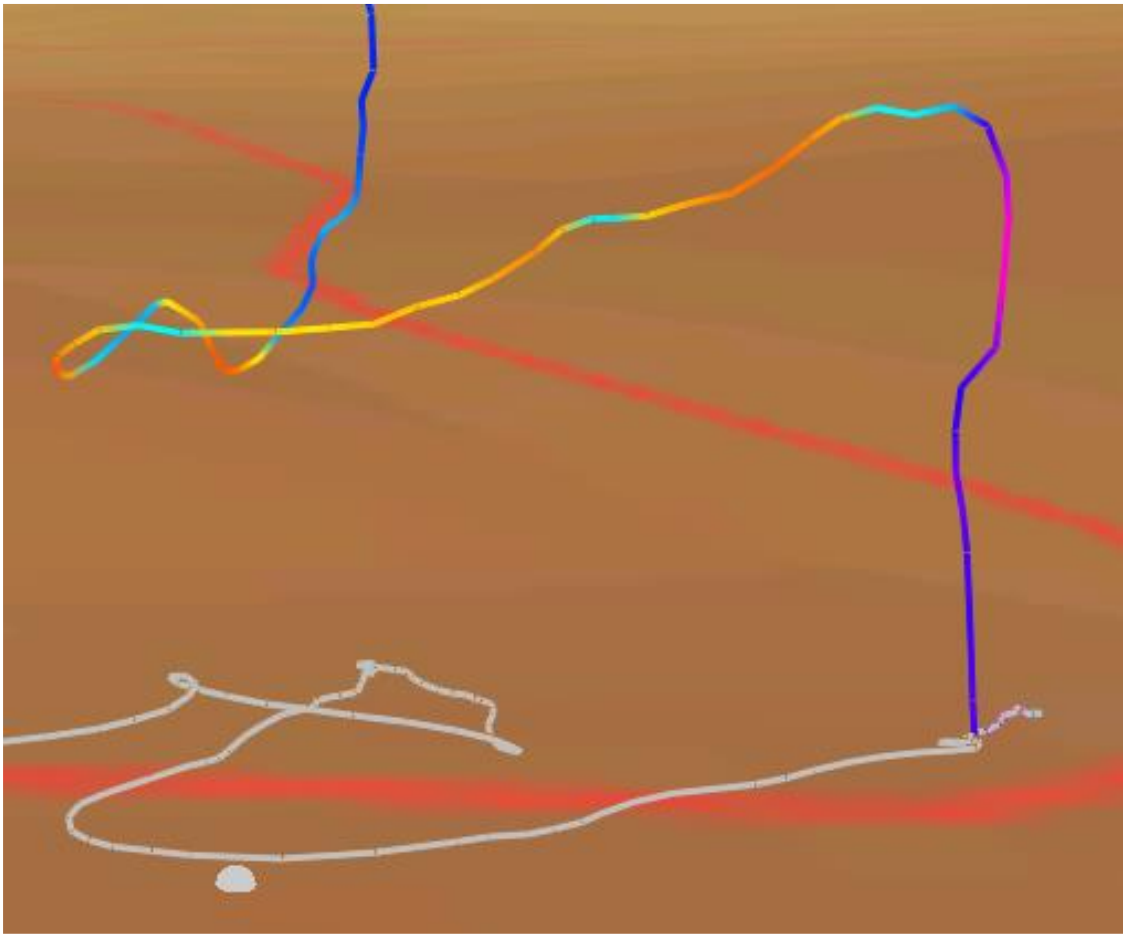

Figure 8: Flight path of the paraglider. (Source: SAHPA)

(i) The descent rate of the paraglider was approximately -16m/s, which equates to 58km per hour (km/h) before crashing on the ground.
(ii) There was evidence of high-speed impact impression marks on the ground.
(iii) The main paraglider was not damaged.
(iv) The paraglider pilot was still strapped to his harness and the helmet on him in situ.
(v) The glider was still attached to harness.
(vi) The paraglider pilot had deployed the reserve parachute.
(vii) The reserve nappy was not found.

1.12.3 The paraglider was inspected post-accident and there were no problems identified with any of the cells, cross ports and V-ribs. All stitching seemed to be in order and there was no damage caused to the leading edge or parts of the paraglider.

1.12.4 The lines were checked and were in excellent condition.

1.12.5 The risers had no trace of any damage.

1.12.6 The paraglider harness ended up on its right-side after impacting the ground. The side protection on the right-side harness was damaged. The side protection on the left-side was not damaged. The rest of the harness was still intact, all webbing and material were in good condition.

1.12.7 The reserve parachute was not damaged; however, it was not contained as expected. Elastic material of the reserve parachute was in good condition.

1.12.8 The glider was formally checked and inspected by Wallendair Service Centre and it was reported and considered to be in a serviceable condition prior to the flight.

1.13 Medical and Pathological Information

1.13.1 The pilot's post-mortem report was not available at the time of finalising this report. Should any of the results have a bearing on the circumstances leading to the accident, they will be treated as new evidence and that will necessitate reopening this investigation.

1.14 Fire

1.14.1 There was no evidence of a pre- or post-impact fire.

1.15 Survival Aspects

1.15.1 The accident was considered not survivable due to the impact force sustained by the paraglider pilot, which resulted in fatal injuries.

1.16 Tests and Research

1.16.1 Paragliding Operation

Note: The information below was taken from a website "HowStuffWorks"

A paraglider is an elliptical aerofoil using leading edge ram air pressure to maintain its shape. The aerofoil designs of a paraglider are many and vary. The low performance wings have a relatively low aspect ratio (short in span and wider through the cord), while high performance wings have higher aspect ratio (longer in span and shorter through the cord).

The controls connected to the trailing edge of the wing are held by the pilot. Depending on how the pilot is pulling or releasing the controls, the wing will change its shape and behaviour. Pulling on the controls causes the glider to fly slower, and releasing it causes the glider to fly faster. The paraglider pilot can also shift his/her weight to help steer the glider.

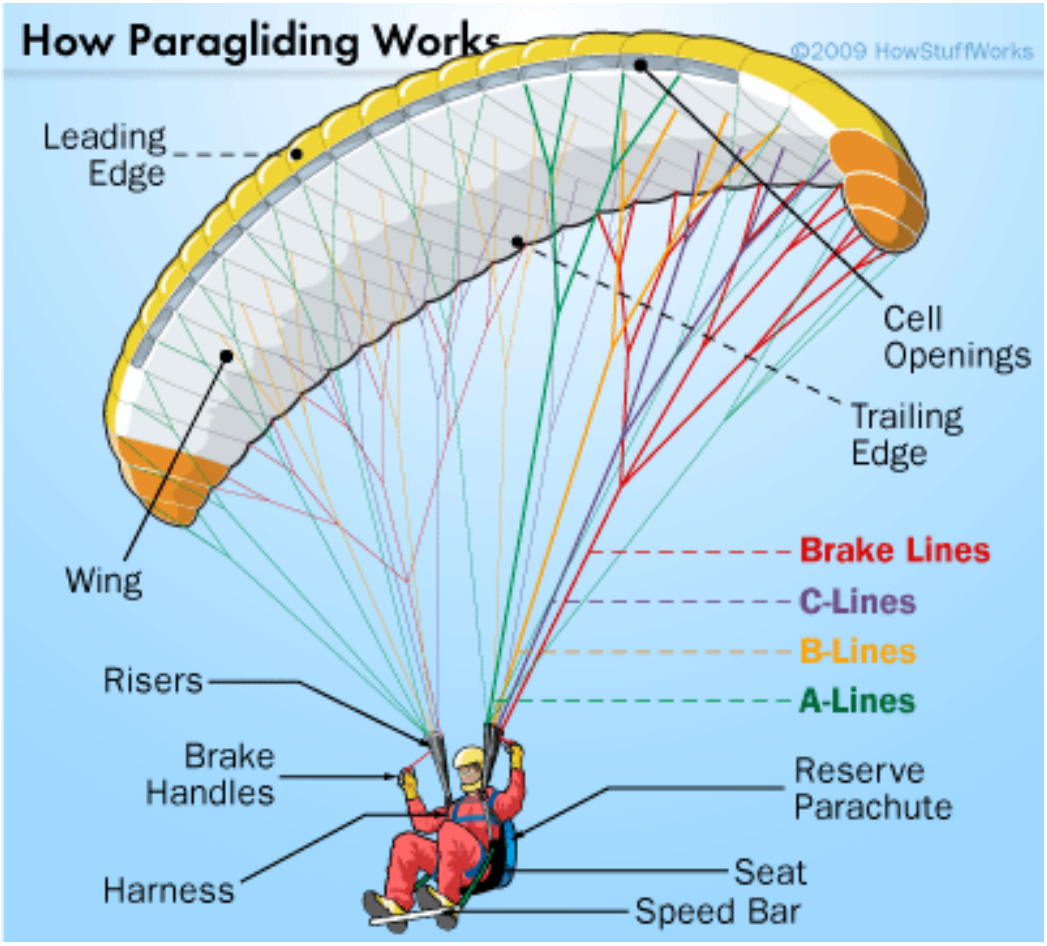

Figure 9: An illustration showing the parts of a paraglider.
(Source: HowStuffWorks website)

1.16.2 When airborne/flying, the following techniques are possible:

Thermalling

(i) *When the paraglider pilot climb via a thermal column, the paraglider pilot turns in a big circle within the thermal (around its core), climbing higher.*

Ridge Soaring

(ii) *When the paraglider pilot fly along the ridge of a mountain or large hill, an updraft created by the mountain keep the paraglider in the air.*

Big Ears

(iii) *The paraglider pilot uses this technique to descend, pulling slightly on the edges of the wing and decrease drag, causing the glider to descent.*

1.16.3 Emergencies:

If the wing begins to deflate due to turbulent air or the paraglider pilot's own miscalculation. The wing will usually re-inflate on its own, but if not, the paraglider pilot may decide to deploy the emergency parachute to land safely. The emergency parachute works best when the

paraglider is at high altitude, which gives the emergency parachute enough chance to completely deploy. If, for any reason, the wing deflation happens close to the ground. The emergency parachute may be unable to deploy quickly enough, and serious injury could occur.

1.16.4 The recommended weight loading of the paraglider is between 105-125kg total weight. A flight test was conducted in this range. The range of the wing loading covers the probable value of paragliders in-flight loading. The following manoeuvres were conducted:

(i) Left- and right-induced asymmetric collapses.
(ii) B-line stalls.
(iii) Point of stall.
(iv) Turns and landing.

1.16.5 There was no anomalous behaviour detected during the flight tests.

1.17 Organisational and Management Information

1.17.1 The paraglider pilot was the owner of the paraglider and had operated in his private capacity.

1.17.2 The operator RAA/005/002 is a registered private owner and is documented/registered at the Aviation and Recreation Organisation (ARO) of SAHPA. The SAHPA has registered private owners who operate under them.

1.18 Additional Information

1.18.1 **Variometer** – a fast response rate of climb instrument usually scaled to match typical glider rates of climb and descent (+/-10 knots or +/- 5 meter/sec). The Variometer makes soaring possible by displaying the glider rate of climb to the pilot in near real time, enabling the pilot to manoeuvre the glider so as to remain in rising air.
(Source: http://www.borgeltinstruments.com)

1.18.2 Variometer tells the paraglider pilot how fast the glider is climbing or falling, relative to the ground. The Variometer has an audio indicator which starts to beep when the paraglider hit a certain speed. The deep pitch increases as the lift of the paraglider increases or decreases as the paraglider sinks.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 The pilot was initially issued a NPL on 18 April 2016 and the renewal was done on 2 July 2018. The last skills test was carried out on 31 July 2018 with an expiry date of 31 July 2019. The pilot was in possession of a self-declaration medical certificate dated 2 July 2018 as per

Part 62.01.10 of the CAR 2011 as amended. The pilot was in possession of the correct qualifications at the time of the accident.

2.2 An investigation was lodged into the cause of the accident. The information found during the investigation process indicated that the pilot had experienced a serious deviation from normal flight, resulting in a rapid spiral descent. It appeared as though the paraglider experienced turbulent conditions whilst flying along a mountain ridge.

2.3 The result was the complete collapse of the glider canopy. The glider started to spiral in an anti-clockwise direction with a maximum descent rate of approximately -16.4 m/s as indicated on the Variometer instrument. The reserve parachute had failed to open fully, possibly due to being deployed at a low altitude. This ultimately resulted in a high-speed impact with the ground.

3. CONCLUSION

3.1 General

From the evidence gathered, the following findings were made with respect to this accident. These shall not be read as apportioning blame or liability to any particular organisation or individual.

To serve the objective of this investigation, the following sections are included in the conclusions heading:

Findings — are statements of all significant conditions, events or circumstances in this accident. The findings are significant steps in this accident sequence, but they are not always causal or indicate deficiencies.

3.1.1 The pilot was initially issued a NPL on 18 April 2016 and the renewal was done on 2 July 2018. The last skills test was carried out on 31 July 2018 with an expiry of 31 July 2019. The pilot was in possession of a self-declaration medical certificate dated 2 July 2018 as per Part 62.01.10 of the CAR 2011 as amended.

3.1.2 The paraglider, which was observed by several other paraglider pilots, launched safely and proceeded to fly northwards along the ridge before other paraglider pilots lost sight of the accident paraglider.

3.1.3 The paraglider was considered to be in a serviceable condition prior to the flight.

3.1.4 The pilot received standard training in respect of Basic SAHPA-approved syllabus and was issued a valid Paraglider Licence by SAHPA.

3.1.5 The paraglider pilot was fatally injured as a result of the accident.

3.1.6 The paraglider was not damaged during the accident sequence.

3.1.7 The flight instrument indicated that the paraglider was in an anti-clockwise spiral descending at a rate of -16 m/s as per the flight data information downloaded from the Variometer instrument.

3.1.8 The reserve parachute was deployed by the pilot at a low altitude estimated to be not more than 150m above ground level (AGL).

3.2 Probable Cause/s

3.2.1 The paraglider encountered turbulence whilst being flown along the mountain ridge, which resulted in the canopy collapsing and the paraglider entering a spiral. The paraglider descended at a rate of -16.4 m/s which was -11.4 m/s faster than the allowed descent rate of 5 m/s.

3.3. Contributory Factor

3.3.1 The pilot did not deploy the reserve parachute at the correct or safe altitude.

4. SAFETY RECOMMENDATIONS

4.1 None.

5. APPENDICES

5.1 Appendix 1: Extracts from CAR 2011 Part 62.01.10 as amended.

5.2 Appendix 2: Extracts from CAR 2011 Part 105 as amended.

6. REFERENCES USED TO COMPILE THIS REPORT

6.1 SAHPA accident report
6.2 Gin Atlas XL report
6.3 Logbooks
6.4 Service confirmation
6.5 Copy of certification
6.6 Photos and eyewitness report from Mr John Rogers
6.7 Analysis of the tracklog from the pilot's Variometer
6.8 Copy of student documentation
6.9 Contact details and other information
6.10 Copy of expert investigator authorisation letter

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

Appendix 1: Extract from CAR 2011 Part 62.01.10

62.01.10 Medical fitness

(1) An applicant for, or holder of, a national pilot licence shall hold an appropriate valid medical certificate issued in terms of part 67, and he or she shall submit a copy thereof to the Director or the organisation designated for the purpose in terms of part 149, as the case may be.

(2) Notwithstanding the provisions of subregulation (1), where a national pilot licence is (to be) endorsed only for the category hang-glider or paraglider, its holder shall complete and submit instead a medical fitness certificate, as prescribed in Document SA-CATS 62.

(3) The medical fitness certificate, prescribed in subregulation (2), shall not be older than three months when submitted.

(4) A new medical fitness certificate, as prescribed in subregulation (2), shall be submitted annually together with the annual currency fee as prescribed in regulation 62.01.19.

(5) The provisions of subregulations (2) to (4) shall not apply in the case of the applicant or the licence holder being the holder of any valid medical certificate issued in terms of part 67.

(6) The holder of a national pilot licence issued in terms of this part shall—

(*a*) not exercise the privileges of that licence—

(i) unless that person—

(*aa*) holds an appropriate valid medical certificate or medical fitness certificate, as the case may be; and

(*bb*) complies with all medical endorsements on that medical certificate or medical fitness certificate;

(ii) while he or she is aware of having a medical deficiency that would make him or her unable to meet the medical standards for his or her medical certificate or medical fitness certificate, until he or she has been assessed medically fit again by an aviation medical examiner designated in terms of part 67 (in the case of the holder of a medical certificate, referred to in subregulation (1)), or by a general medical practitioner (in the case of the holder of a medical fitness certificate, referred to in subregulation (2)).

SACATS

62.01.10 MEDICAL FITNESS

1. Format for personal medical fitness certificate

(1) Personal declaration:

A medical fitness certificate to be submitted by the applicant for or the holder of a national pilot licence in terms of CAR 62.01.10(2) shall be on form APPENDIX R62.22.

(2) Medical practitioner's declaration:

Where a person feels unable to sign the Pilot's declaration, referred to in paragraph1, or where an aviation training organisation or an authorised Licensing and Safety Officer of an aviation recreation organisation is reluctant to accept the declaration, a Medical Practitioner's Declaration must be submitted.

(3) Requirement for hang- or paraglider ratings:

A Medical Practitioner's Declaration is required in respect of the holder of a national pilot license with a hang- or paraglider endorsement, in addition to the Pilot's Declaration (if any) per format prescribed in APPENDIX R62.23.

2. Medical conditions to watch for

The following conditions may cause severe safety risks when flying. Any person suffering, or having suffered, from any of these conditions, must seek medical opinion before any further:

(1) Chronic bronchitis, severe asthma, chronic sinus disease, chronic ear disease, eye trouble (e.g. inability to read a car number plate at 25 metres – corrective glasses may be used), regular severe migraine.

(2) Diabetes in any form, rheumatic fever, kidney stones, psychiatric disorders, severe motion or travel sickness, any condition requiring the regular use of drugs or other medication.

(3) Injuries that were previously sustained and that may inhibit control of an aircraft.

Appendix 2: Extract from CAR 2011 Part 105

105.01.1 (1) This part applies to the operation of parachutes.

(2) This part does not apply to—

(*a*) persons making emergency descents; or

(*b*) persons making base jumps.

Persons making parachute descent

105.01.2 (1) Any person making a parachute descent shall—

(*a*) be a *bona fide* member of an aviation recreation organisation designated by the Director or organisation designated for the purpose as the case may be in terms of part 149;

(*b*) be authorised by such approved aviation recreation organisation to make such parachute descent;

(*c*) comply with the privileges and limitations of the authorisation referred to in paragraph (*b*);

(*d*) comply with the standards and procedures determined by such approved aviation recreation organisation;

(*e*) comply with the currency requirements determined by such approved aviation recreation organisation.

(2) Notwithstanding anything in this part, no parachuting activities shall be undertaken in conflict with the applicable the aviation recreation organisation's approved manual of procedures.

Alcohol and drugs

105.01.3 No person shall make a parachute descent while under the influence of alcohol or a drug having a narcotic effect, to the extent where the safety of such person or other persons is likely to be endangered