



PARAGLIDER ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9792	
Paraglider Registration	N/A	Date of Accident	6 June 2019		Time of Accident	1200Z
Type of Aircraft	Paraglider APCO Fiesta		Type of Operation		Training (Part 141)	
Pilot-in-command Licence Type		Student Pilot (Paraglider)	Age	30	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	3 Hours 28 Minutes		Hours on Type	3 Hours 28 Minutes
Last Point of Departure		Bulwer 1000 KwaZulu-Natal Province				
Next Point of Intended Landing		Bulwer 1000 KwaZulu-Natal Province				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Bulwer at GPS South 29° 48' East 029° 45' at an elevation of 6036ft AMSL						
Meteorological Information		Surface wind: Less than 15 km/h, Temperature: 25°C, Visibility: Good				
Number of People On-board		1	No. of People Injured		0	No. of People Killed
Synopsis						
<p>On Thursday, 6 June 2019 at 1200Z, a paraglider student pilot took off from the mountain site Bulwer 1000 under the radio instruction of the chief flying instructor and take-off instructor. This was the student pilot's training flight to complete his basic requirements for a paraglider licence. After the student pilot had completed the required manoeuvres, he was handed over to the landing site instructor for the radio instructions to land the paraglider.</p> <p>During approach for landing, the paraglider entered into a spin which progressed into a spiral. The student pilot was unable to recover from the resultant spiral due to insufficient height. He impacted the slope on approach path to land, adjacent Bulwer reservoir. The accident sequence was recorded on a video camera mounted on the student pilot's helmet. The video footage revealed that he applied deeper brake input to turn and had limited weight-shift to compensate for the turn. The student pilot also tended to hold on to the risers and had a right brake line wrapped around his hand from the start of the flight, which he corrected later in the flight.</p> <p>The student pilot was fatally injured whilst the paraglider sustained minor damage during the accident sequence.</p> <p>The investigation revealed that the accident was likely caused by excessive brake input on approach turn, which resulted in a spin that later progressed into a spiral. The student pilot could not recover from the spiral due to insufficient height.</p>						
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	DESCRIPTION
AGL	Above Ground Level
AIID	Accident and Incident Investigations Division
AIP	Aeronautical Information Publication
AMSL	Above Mean Sea Level
ARO	Aviation and Recreation Organisation
CAR	Civil Aviation Regulation
CAVOK	Ceiling and Visibility OK
CFI	Certificated Flight Instructor
C of R	Certificate of Registration
E	East
ft	Foot/feet
GPS	Global Positioning System
kt	Knot
METAR	Meteorological Aeronautical Report
S	South
SACAA	South African Civil Aviation Authority
SAHPA	South Africa Hang Gliding and Paragliding Association
SAPS	South African Police Service
SAWS	South African Weather Service
UTC	Co-ordinated Universal Time denoted by Z
Z	Zulu (Greenwich Mean Time)

Name of Owner/Operator : Wildsky Paragliding
Manufacturer : APCO Aviation
Model : Fiesta (Size Medium); Age: 10 years /50 hours
Nationality : South African
Registration Marks : None
Place : Bulwer, KwaZulu-Natal
Date : 6 June 2019
Time : 1200Z

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.***

Investigations Process

The accident was reported to the Accident and Incident Investigations Division (AIID) on 6 June 2019 at about 1230Z. The AIID did not dispatch to the accident scene.

The AIID appointed an expert from the South African Hang Gliding and Paraglider Association (SAHPA) to conduct an on-site investigation under AIID investigator-in-charge (IIC). The factual information was obtained from the standard SAHPA accident and incident report – Annex 6, interviews with the instructors from Wildsky Paragliding School, independent report and further telephone interviews with an eyewitness (pilot) who was flying nearby the student paraglider pilot at the time of the accident. The film footage from the video camera affixed to the helmet of the student paraglider pilot at the time of the fatal accident was also used in this investigation.

Notes:

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

- Accident – this investigated accident*
- Aircraft – APCO Aviation Fiesta medium size 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:

This report is given without prejudice to the rights of the AIID, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 On Thursday, 6 June 2019 at 1200Z, a paraglider student pilot on a training flight to complete the requirements of his basic paraglider licence, took off from the mountain site Bulwer 1000 under the radio instruction of the chief flying instructor and take-off instructor. The student pilot completed the required manoeuvres and was then handed over to the landing site instructor for radio instructions to land the paraglider.
- 1.1.2 The student pilot successfully operated the paraglider with no events until the preparation phase for landing. The video footage recovered from the camera which was mounted on the student pilot's helmet revealed that he applied deeper brake input to turn, however, he had limited weight-shift to compensate for the turn. The student pilot also tended to hold on to the risers and had a right brake line wrapped around his hand from the start of the flight, which he corrected later during the flight.
- 1.1.3 The landing site instructor and other witnesses saw the paraglider on approach for landing conducting S-turns before commencing the final landing run. The paraglider entered into a spin which progressed into a spiral. The student pilot was unable to recover from the spiral due to insufficient height. He impacted the slope on approach path to land, which is adjacent to the Bulwer reservoir.
- 1.1.4 The student pilot was fatally injured during the accident sequence. The paraglider sustained minor damage.
- 1.1.5 The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be: S 29°48' E 029°45' at an elevation of 6036 feet (ft) above mean sea level (AMSL).

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	1	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	-	-	-	-

1.3 Damage to Paraglider and Helmet

- 1.3.1 The paraglider sustained minor non-structural damage (torn). The student pilot's helmet had impact marks caused by camera mounting as a result of impact pressure. However, the camera mounting did not penetrate the helmet shell.

1.4 Other Damage

1.4.1 None.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	30
Licence Number	9013	Licence Type	Student Paraglider		
Licence Valid	Yes	Type Endorsed	N/A		
Ratings	None				
Medical Expiry Date	Self-declared				
Weight of Pilot	80kg				
Restrictions	Nil				
Previous Accidents	None				

Flying Experience:

- 1.5.1 According to information submitted by Wildsky, the student pilot was in the process of completing his basic paragliding licence requirements, which require a minimum of 35 flights and 4 hours flight time.
- 1.5.2 The student pilot's logbook (see Annexure 2) indicated that prior to this fatal flight, he had three (3) hours and twenty-eight (28) minutes of flight time and had completed 31 flights.
- 1.5.3 This was the student pilot's third flight of the day.

1.6 Paraglider Information

Type	Paraglider AFNOR Standard
Serial Number	764372
Manufacturer	APCO Aviation
Model	Fiesta 2
Size	Medium
Colour	Yellow/Blue/White
Weight Range	85kg – 105kg
Inspection Date	21 February 2017

- 1.6.1 A service inspection was completed on the paraglider by an approved service centre on 21 February 2017 and it was found to be in a serviceable condition.
- 1.6.2 The service report indicated a 55mm shortening of the brakes from original specifications. The modification had no bearing to the accident.
- 1.6.3 The student pilot's body weight was 80kg and, together with the weight of the harness and wing, the total weight was within the weight range of the paraglider.

Harness:

Type	Standard
Manufacturer	Gin
Model	Genie II (2)

NOTE: The report indicated a 55mm shortening of the brakes from original specifications. These gliders are known to have a sluggish turn and, often, brakes are shortened to provide better brake response. However, this raises the proximity to stall point. This is not normally a problem if flown with effective weight shift and results in the better handling of the glider. Some pilots do not shorten the brakes but take a "wrap" (wind the line around one's hand) which results in +/- 100mm take-up of the brake line slack.

1.7 Meteorological Information

1.7.1 The weather information in the table (below) was obtained from the South African Weather Service (SAWS) at King Shaka International Aerodrome on 6 June 2019 between 1100Z and 1200Z.

Wind direction	NE/E/SE	Wind speed	<15km/h/8kt	Visibility	Good
Temperature	Unknown	Cloud cover	Nil	Cloud base	Nil
Dew point	Unknown				

1.8 Aids to Navigation

1.8.1 None.

1.9 Communication

1.9.1 The paraglider had a type 2M Hand-held Radio Transceiver. The radio transceiver was in a serviceable condition due to clear communication heard on the film footage. There was no proof found during the investigation which indicated that the paraglider broadcasted any information before it entered into a spin. The last communication was from a landing instructor giving landing instructions.

- (i) The commands and instructions given as per the audio from the film footage were commensurate with what would be expected in any normal ab initio paragliding training flight.
- (ii) The take-off instructor had, during communication with the student pilot, suggested that he uses more weight shift.
- (iii) The take-off site instructor had handed over control and communications to the landing site instructor during the landing phase.

1.10 Paragliding Site Information

1.10.1 The student pilot was involved in an accident at a registered SAHPA paragliding site referred to as Bulwer 1000.

1.10.2 The site is for paragliding student training and is graded Basic.

1.10.3 The accident site is on the slope next to the Bulwer reservoir. The position is considered the start of the final approach to the landing site (field).

1.10.4 The site is also used for first flights (hop and pops) to get new pilots used to taking off and landing at the landing site.

1.10.5 The field elevation of the accident site is approximately 1500 metres (m) or 4921ft AMSL. The take-off is at 330m or 1082ft above ground level (AGL) or 1840m (6036ft) AMSL. The location is at GPS co-ordinates: S 29°48' E 029°45'.

1.11 Flight Recorders

1.11.1 The paraglider was not fitted with a flight recorder and it is not a requirement by SAHPA for it to be fitted to this paraglider.

1.12 Wreckage and Impact Information

1.12.1 The on-site investigation was conducted by the South African Police Service (SAPS), assisted by the chief flying instructor from the SAHPA. On 7 December 2019 during the on-site investigation process conducted by the National Safety Officer (NSO) of the SAHPA and the chief flying instructor, the paraglider equipment was briefly inspected, and further analysis was conducted off site.

1.12.2 The paraglider was inspected, and no fault was identified with any of the cells, cross ports or V-ribs. All stitching was found to be in order and there was no damage caused to the leading edge or parts of the paraglider.

1.12.3 The lines were checked, and no damage was observed.

1.12.4 The risers had no trace of any damage.

1.12.5 The harness was intact; all webbing and material was in average condition, but showed slight damage caused during the accident.

1.12.6 The risers were removed from the carabiners for first aid inspection purposes.

1.13 Medical and Pathological Information

1.13.1 The student 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 the reopening of the 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 student pilot, which resulted in fatal injuries.

1.16 Tests and Research

1.16.1 Paragliding Operation

Note: The information below was taken from the website: HowStuffWorks

A paraglider is an elliptical airfoil using leading edge ram air pressure to maintain its shape. The airfoil 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 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.

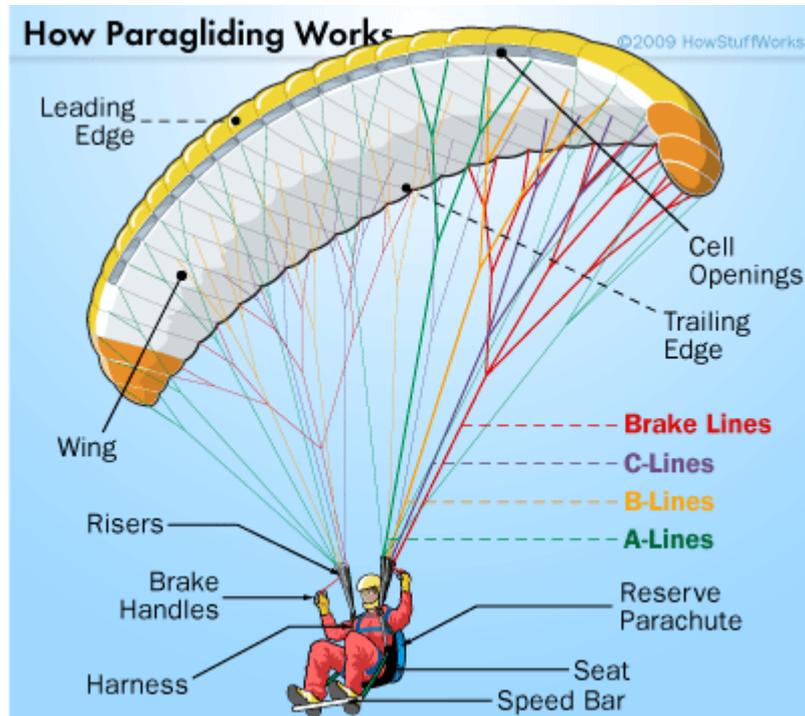


Figure 1: Illustration of a paraglider. (Source: HowStuffWorks)

1.16.2 When airborne/flying the following techniques are possible:

Thermalling

- (i) *When the paraglider and pilot climb via a thermal column. The paraglider pilot turns in a circle within the thermal climbing in altitude resulting in an increase in altitude.*

Ridge Soaring

- (ii) *When the paraglider pilot flies along a ridge of a mountain or large hill, where an updraft created by the mountain resides this “wave” of lifting air will create lift which the paraglider uses to remain airborne.*

Big Ears

- (iii) *The paraglider pilot uses this technique to descend, pulling slightly on the front side edges of the wing collapsing them creating a smaller surface area and an increase in drag and increase in wing loading with the resultant effect of decreased glide ration and a quicker descent.*

S turns

- (iv) *Turns to right or left used to lose height and often doubling back 180 degrees for purposes of lining up for final glide into the landing*

1.16.3 Emergencies:

If the wing begins to deflate, due to turbulent air or aggressive brake input (i.e. Stalling a wing or part of the wing 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 and normally takes 3 – 5 seconds to properly inflate and take load 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.

1.17 Organisational and Management Information

- 1.17.1 The student pilot was utilising equipment supplied by a registered paragliding school while under instruction. The equipment was the correct size and type for the instructional flight training he was receiving.
- 1.17.2 The operator (Wildsky) with Aviation Training Organisation (ATO) number PEL 02040 – RAA/005/002 is a registered school and documented at the Aviation and Recreation Organisation (ARO) SAHPA. The SAHPA has registered schools which operate under the Aviation and Recreational Organisation (ARO), and Wildsky is among those.
- 1.17.3 The flight was a training flight. The ATO was in possession of an approved ATO certificate issued on 12 February 2019 with an expiry date of 28 February 2020. The operator was also in possession of an approved operations manual. The paraglider type and the training type were also endorsed on it.

1.18 Additional Information

The camera used by the student pilot during the flight creates unique footage which requires “stitching” to create a normal image in a 360-degree view format. While the camera uploads the film footage to an internal Secure Digital (SD) card, it does so from the internal Random Access Memory (RAM) of the camera. If the camera is incorrectly turned off (as was the case with this event where the impact suddenly turned off the camera), then the (RAM) footage would be lost, and this footage would not be found on the last film entry on the SD card. Furthermore, the last file is normally corrupted and cannot be viewed. In this instance, the investigators were able to access the corrupted footage after it had been sent to a specialised cinematography repair site in the United States (USA). The final footage, excluding the RAM footage, contained vital information regarding the last segments of the flight. Without this information, a very different conclusion to the possible causal factors would have resulted.

Note: The photos supplied are from unstitched footage because the expert did not have a legal licence to stitch, thus, could not place stitched footage in this document.

1.19 Useful or Effective Investigation Techniques

- 1.19.1 None.

2. ANALYSIS

2.1 General

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

- 2.1.1 The investigation revealed that the student pilot deviated from normal flight (a negative spin) during approach for final glide phase of his flight, which resulted in an impact with terrain and fatal injuries.
- 2.1.2 The flight, for the most part, was uneventful and was a combination of ridge soaring and mostly thermalling, as observed on the film footage which documented this flight from pre-take-off to descent preparation for final glide, just moments before impact.
- 2.1.3 The student pilot had set up for take-off as expected, however, he had (what is referred to as) a brake line wrap on his hand. This is not serious but does provide minor inhibition of full and free brake movement. The brake line wrap was on his right hand. Furthermore, the pilot had a camera mounted on his helmet that was, somewhat, ungainly. The addition of turning it on and the position of it was an added step that was not normally found in ab initio training pre-flight preparation. A brake line wrap is normally observed shortly after take-off or during post take-off checks. In this case, the brake line wrap remained for most part of the flight. When the first segment of the flight footage ended, the brake line was still wrapped around the student pilot's hand.
- 2.1.4 The student pilot repeatedly placed his hand to his face to what seemed like repositioning his spectacles.
- 2.1.5 The extra length of the tripod and weight of the camera in the windstream seemed to push the camera backwards and, thus, pushed the helmet backwards, pivoting on the chin strap. This resultant movement, which affected his spectacles, created a need to periodically correct this.
- 2.1.6 The student pilot had regularly and repeatedly held on to his risers, instead of having his brakes inhibited and free flowing to adjust to differing pressures. This resulted in the pilot gripping the risers and could not affect necessary brake input response as required when a deflation happened.
- 2.1.7 A service report indicated a 55mm shortening of the brakes from original specifications. These gliders are known to have a sluggish turn. Brakes are shortened to provide better response; however, these could raise the likelihood to stall. This is not a problem if flown with effective weight shift and often results in a better handling of the paraglider. Some pilots do not shorten the brakes but take a "wrap" (wind the line around one's hand) which results in +/- 100mm take-up of the brake line slack. The combination of limited weight shift, shortened brake lines, holding on to the risers and excessive brake input when added together could result in a possible stall when turning. This, combined with inexperience, could result in a deviation from the normal flying envelope.
- 2.1.8 The student pilot, while preparing for the final glide, had commenced with S-turns which required firm brake input. If not done with weight shift, they could affect the 180-degree turns required.
- 2.1.9 The student pilot was instructed at approximately 100m AGL to turn out towards the landing field and make a sudden turn to the right (i.e. in a clockwise direction).
- 2.1.10 The glider then negatively spun (the right-hand side wing stalled with the non-stalled wing i.e. the left-hand side flying) in a clockwise direction (to the right), completing two 360-degree rotations.

- 2.1.11 The landing site instructor, via radio, commanded the pilot to raise his hands fully. The command used was “hand up” and the effect is that the glider will pitch nose forward depending on its attitude and resume normal flight. This command was delivered based on the statement by the landing site instructor multiple times. Based on the statements, this resulted in the paraglider wing exiting the negative spin and diving in a downwards motion while still rotating.
- 2.1.12 The landing site instructor instructed the student pilot to apply brakes to inhibit the dive which was not actioned by the student pilot, resulting in a hard impact with terrain.
- 2.1.13 Emergency services were summoned via cellular phone and the landing site instructor had rushed to the accident site in her car.
- 2.1.14 Upon arrival at the accident site, the instructor had check for vital signs, that is, pulse and breathing and found none, indicating a possible death on impact.
- 2.1.15 A fellow experienced paragliding pilot was next to arrive at the scene of the accident. He had noted that the brake line was in the student pilot’s hand. He unclipped the riser to allow first aid access if necessary and to inhibit the body that was being dragged by the wind from the impact site. He checked again for pulse and vitals and found none.

3. CONCLUSION

3.1 General

From the evidence gathered, the following preliminary 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 student pilot’s intention was to complete another training flight sortie and gain experience, but as per the observations, he also aimed to obtain camera footage of the flight.
- 3.1.2 The student pilot (as per the observations on the film) was flying without performing his post-launch checks sufficiently and, seemingly, was concentrating more on his filming and his body position to enable his filming than flying the paraglider with the commensurate weight shift and attention.
- 3.1.3 The paraglider was in a serviceable condition prior to the flight even with the marginal shortening of the brake lines and minor trim deficiencies as per the last service report. The service report indicated a 55mm shortening of the brakes from original specifications. The modification had no bearing to the accident.
- 3.1.4 The student pilot had received standard training in respect of the syllabus to enable him to obtain a basic SAHPA paraglider licence on a valid student membership.
- 3.1.5 The student pilot had a poorly positioned camera for aviation requirements set up to aid filming requirements.

- 3.1.6 The pilot was fatally injured in the accident upon impact with terrain.
- 3.1.7 The harness and camera with tripod sustained minor damage during the accident sequence.
- 3.1.8 The eyewitness testimony from two sources indicated that the paraglider was in a clockwise spiral prior to impact after exiting a negative spin.
- 3.1.9 The student pilot's inexperience and failure to react to the commands timeously resulted in the paraglider not resuming normal flight with enough height to continue on the intended course to landing.
- 3.1.10 The student pilot was clipped between the lower and middle of the weight range, thus, the stall point would have been marginally raised and the turning would have been a little slower. This means that the reaction to turning input would have been a little slower (lagging) which would most probably influence the student pilot to give more input, thus, bringing the paragliding wing closer to stall point.

3.2 Probable Cause/s

- 3.2.1 The investigation revealed that the accident was likely caused by excessive brake input on the approach turn, which induced a negative spin. The glider dived in an unrecoverable spiral upon exiting the negative spin.

3.3. Contributory Factor

- 3.3.1 Incorrect body position and inadequate weight shift.
- 3.3.2. Excessive brake input.
- 3.3.3 Negative spin exiting into spiral.
- 3.3.4 Camera and filming taking attention of the student pilot.
- 3.3.5 Holding on to risers when flying or turning, resulting in slower responses to brake input.
- 3.3.6 Camera mounted on helmet, resulting in helmet and glasses moving during flight, which required correction by using his hands which were also controlling the brakes.

4. SAFETY RECOMMENDATIONS

- 4.1 It is recommended to the operator that no camera must be mounted or added to helmets during ab initio training.
- 4.2 It is recommended that during the training exercises, instructors concentrate on accentuating weight shift with turns.

5. APPENDICES

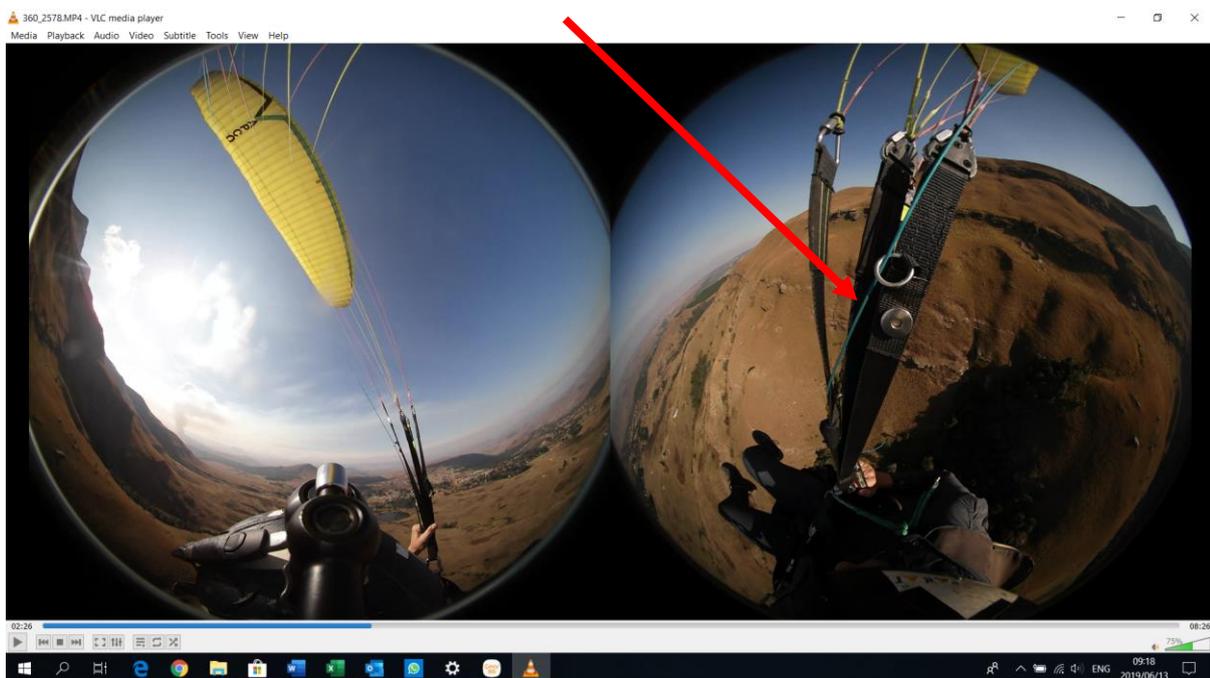
- 5.1 Appendix A: Photos from the camera mounted on the helmet of the student pilot.

6. REFERENCES

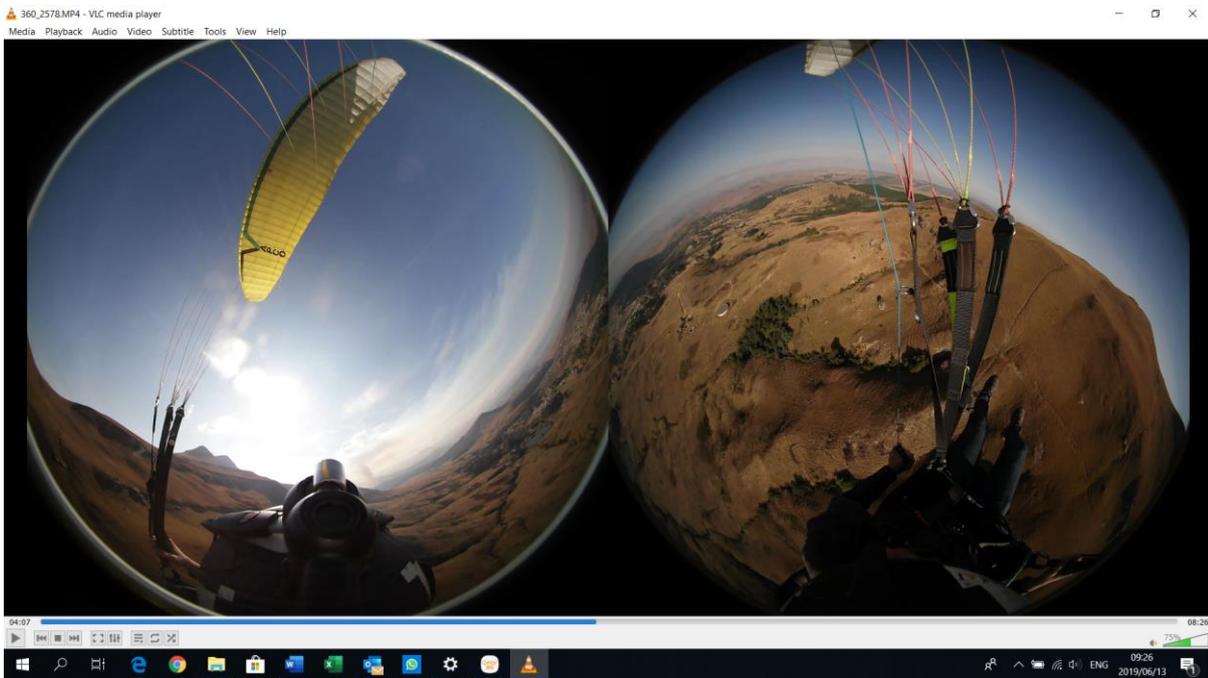
References used to compile this report

- 6.1 Reports and shipping of equipment for test.
- 6.2 Logbooks.
- 6.3 Service confirmation.
- 6.4 Copy of certification.
- 6.5 SAHPA accident report.
- 6.6 Photos and eyewitness report from Mr John Rogers.
- 6.7 Newspaper notification report.
- 6.8 Copy of police case notification as supplied by SAPS.
- 6.9 Copy of student documentation.
- 6.10 Contact details and other information.
- 6.11 Copy of Expert investigator authorisation letter.

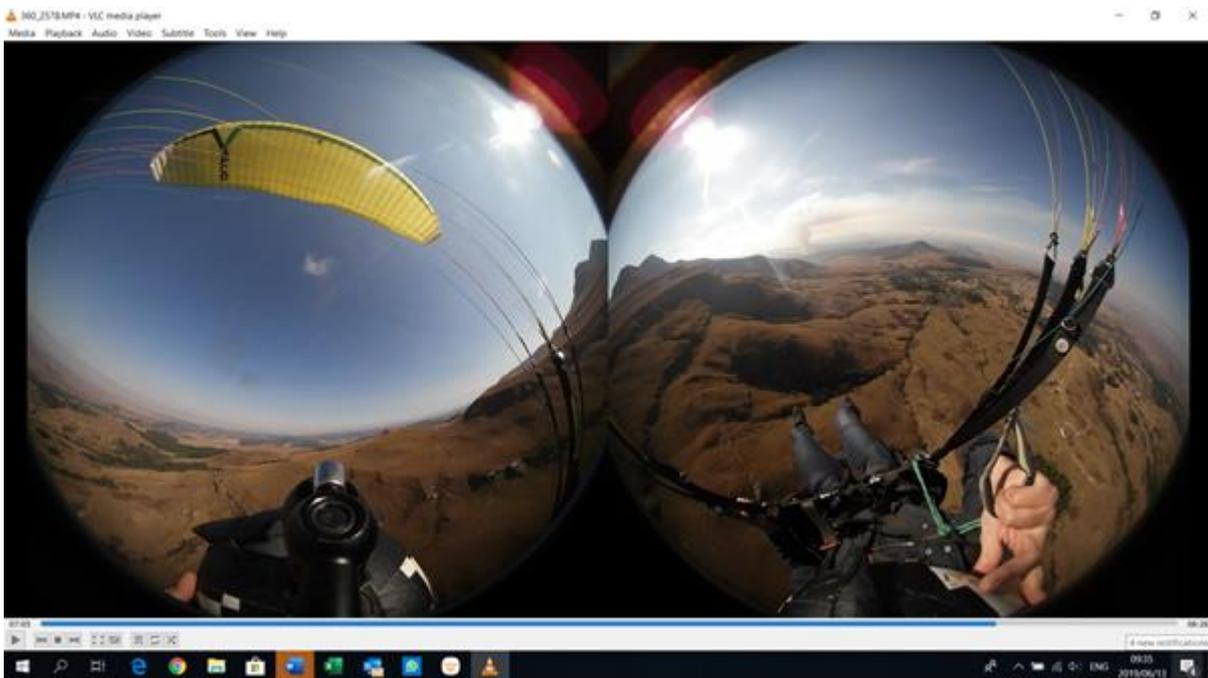
Appendix A: A review of the film footage to ascertain student pilot's flying style, positioning and paraglider characteristics on the final approach for landing.



The student pilot was observed using limited weight shift and, therefore, excessive brake input to complete turns and thermal turns.



The pilot was flying with a more vertical body position to enable his camera to remain better aligned to the horizon, especially during turns.



Demonstration of how the student pilot repeatedly held on to his risers.