AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:		SP 0088	
Aircraft Registration	**N/A**	**Date of Accident**	18 October 2009			**Time of Accident**	1400Z
Type of Aircraft	Paraglider		**Type of Operation**		Private		
Pilot-in-command Licence Type	Paraglider		**Age**	37	**Licence Valid**		Yes
Pilot-in-command Flying Experience	Total Flying Hours		31,7		Hours on Type		Unknown
Last point of departure	Dunnottar Airfield (Gauteng)						
Next point of intended landing	Delmas Airfield (Gauteng)						
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)							
At GPS co-ordinates S26˚19.864 E028˚32.460 near Springs.							
Meteorological Information	Surface wind: 240˚/10 kt; Temperature: 25˚C; Visibility: Good.						
Number of people on board	1 + 0	**No. of people injured**	0	**No. of people killed**	1		

Synopsis

The pilot planned to fly the paraglider from Dunnottar Airfield to Delmas Airfield, and was winched into flight at approximately 1230Z. The aircraft was reported missing by a member of the South African Hang Glider and Paragliding Association (SAHPA) at 1700Z. A search-and-rescue operation was initiated by South African Search and Rescue (SASAR).

The paraglider was found the following day on a farm near Springs.

The pilot had been fatally injured.

Probable Cause

Undetermined but probably caused by turbulence.

IARC Date		Release Date	

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Not applicable
Manufacturer : APCO Aviation
Model : Vista
Nationality : South African
Registration Marks : None
Place : Springs at GPS co-ordinates: S26˚19.864 E028˚32.460
Date : 18 October 2009
Time : 1400Z

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 (1997), 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 establish legal liability****.*

Disclaimer

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

1. FACTUAL INFORMATION

1.1 History of Flight

1.1.1 The pilot planned to fly from Dunnottar Airfield to Delmas Airfield, and the paraglider was winched into flight at approximately 1230Z. Soon afterwards, the winch operator noticed that the aircraft was flying too high and radioed the pilot to warn him of this. He saw the paraglider perform a standard “Big Ear” descent manoeuvre, after which it flew away in the direction of Delmas. The last time the operator saw the paraglider, it was flying at approximately 300 m above ground level (AGL).

1.1.2 The paraglider did not arrive at Delmas Airfield and was reported missing by a member of the South African Hang Glider and Paragliding Association (SAHPA) at 1700Z. A search-and-rescue operation was initiated by South African Search and Rescue (SASAR). The paraglider was discovered the following day on a farm near Springs and the pilot was found to have been fatally injured.

1.2 Injuries to Persons

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

1.3 Damage to Aircraft

1.3.1 The paraglider sustained substantial damage.

Figure 1. The wreck of the paraglider.

1.4 Other Damage

1.4.1 None.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	37
Licence Number	xxxxxxxxxxxx	Licence Type	Paraglider		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Basic				
Medical Expiry Date	N/A				
Restrictions	N/A				
Previous Accidents	Unknown				

Flying Experience:

1.5.1 According to information submitted by SAHPA, the pilot had been flying paragliders since 2008. He had completed standard training, following the correct syllabus, before been issued with a licence. He had then logged 92 flights (launches) and accumulated 31,7 hours of flight time. He had accumulated approximately five hours in the 90 days prior to the accident flight.

1.6 Aircraft Information

Glider

Type	Paraglider LTF 2
Serial Number	181241
Manufacturer	APCO Aviation
Model	Vista
Size	Large
Colour	Yellow
Weight Range	100 kg – 125 kg
Production Inspection Date	1 July 2009

1.6.1 An inspection was performed on the paraglider and ancillary equipment on 1 July 2009 and it was all found to be in a serviceable condition.

Harness

Type	Standard
Manufacturer	APCO Aviation

Figure 2. The harness.

Reserve Parachute

Manufacturer	APCO Aviation
Serial Number	837667
Production Date	March 2008

Figure 3. The reserve parachute.

1.6.1 There was no documentary evidence indicating when the reserve parachute had last been packed or inspected. During the onsite investigation it was found that the reserve parachute was not contained, from which it would appear that the pilot had attempted to deploy the parachute.

1.7 Meteorological Information

1.7.1 The following weather conditions at OR Tambo International Aerodrome at the time of the accident were obtained from South African Weather Service (SAWS):

Wind direction	240˚	Wind speed	10 kt	Visibility	Good
Temperature	25˚C	Cloud cover	CAVOK	Cloud base	CAVOK
Dew point	Unknown				

1.8 Aids to Navigation

1.8.1 The pilot carried a variometer (vertical speed indicator).

1.9 Communications

1.9.1 The pilot had a Type 2M handheld transceiver, which was considered to be in a serviceable condition. No proof was found indicating that he had broadcast any information during the flight. The last known communication had come from the winch operator, who had informed the pilot of his height. The pilot had not responded but had reacted by performing a standard descent manoeuvre to correct the height.

1.10 Aerodrome Information

1.10.1 The accident took place outside the boundaries of an aerodrome. The accident site was on a farmer's field near Springs at GPS co-ordinates S26˚19.864'

E028˚32.460', and at an elevation of 5 196 ft AGL.

1.11 Flight Recorders

1.11.1 N/A

1.12 Wreckage and Impact Information

1.12.1 The onsite investigation was conducted by SACAA, assisted by SAHPA. During this process, the wreckage and ground impact markings were inspected, and later compared with the information found on the variometer. The following was established:

(i) The descent rate of the paraglider was approximately 12,6 m/s (45 km/h).
(ii) High-speed impact impression marks were found on the ground.
(iii) There was a line-over on the right of the glider.
(iv) There was entanglement of the left side of glider.
(v) The right riser had detached from the caribiner.
(vi) The pilot had deployed the reserve parachute.
(vii) The reserve nappy was found 99 m from the impact area.

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

1.12.3 The lines were checked and only a minimal amount of damage was observed to the sheathing of two of the lines.

1.12.4 The risers were very dirty, but showed no trace of damage.

1.12.5 The paraglider harness ended up on its left side after striking the ground. The side protection on the right side was damaged, whereas that on the other side was undamaged. The rest of the harness was still intact, and all webbing and material were in a good condition.

1.12.6 The reserve parachute was not damaged, but was not contained as expected. All elastic material of the reserve parachute was in a good condition.

Figure 4. Paraglider equipment removed from the accident site.

1.13 Medical and Pathological Information

1.13.1 The medico-legal post mortem was performed by Forensic Pathology Services, Gauteng Department of Health on 20 October 2009. The result concluded that the cause of death was multiple blunt-force injuries.

1.14 Fire

1.14.1 There was no pre- or post-impact fire.

1.15 Survival Aspects

1.15.1 The paraglider was reported missing at approximately 1700Z on 18 October 2009. A search-and-rescue operation was initiated by South African Search and Rescue (SASAR) and lasted throughout the night. The paraglider was located the following morning at about 0650Z. The pilot had been fatally injured.

1.15.2 There was evidence that the pilot was conscious after the impact. He had removed his helmet, and unclipped the riser, leg straps and chest strap before succumbing to his injuries.

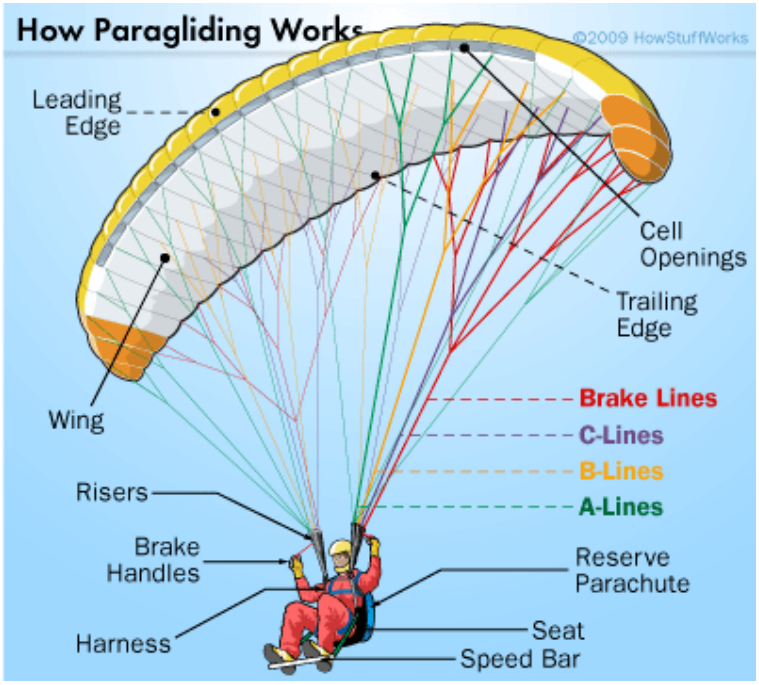
1.16 Tests and Research

1.16.1 Paragliding Operation

The information and illustration below was excerpted from *www.howstuffworks.com*.

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 varied. 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 pulls or releases the controls, the wing will change its shape and behaviour. Pulling on the controls causes the glider to fly more slowly and releasing it causes the glider to fly faster. The paraglider pilot can also shift his/her weight to help steer the glider.



1.16.2 When airborne, the following techniques are possible:

(i) Coring – when the paraglider pilot climbs via a thermal column. The pilot turns in a big circle within the thermal (around its core), climbing higher.

(ii) Ridge soaring – when the paraglider pilot flies along the ridge of a mountain or large hill, where an updraft created by the mountain keeps the paraglider in the air.

(iii) Big Ears – the paraglider pilot uses this technique to descend, pulling slightly on the edges of the wing and decreasing 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. If not, the pilot may decide to deploy the emergency parachute to land safely. This parachute works best when the paraglider is at high altitude, which gives it enough chance to deploy completely. 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 A flight test was conducted at 98 kg and 113 kg total flying mass. The range of the wing-loading covered the probable value of the paraglider's 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 No anomalous behaviour was detected during the flight tests.

1.17 Organisational and Management Information

1.17.1 The paraglider pilot was also the owner of the aircraft, and operated in his private capacity.

1.17.2 The SACAA delegated the investigation process to the South African Hang Gliding and Paraglider Association (SAHPA), who produced an accident report and forwarded it to the SACAA. The information contained in the SACAA report was taken from the SAHPA report.

1.18 Additional Information

1.18.1 **Variometer:** this tells the paraglider pilot how rapidly the glider is climbing or falling relative to the ground. The instrument has an audio indicator, which begins to beep when the paraglider achieves a certain speed

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 An investigation into the cause of the accident found that the pilot experienced a serious deviation from normal flight and the glider fell through its lines. It appears that the pilot experienced turbulent weather conditions at the time.

2.2 The result was a line-over to the right of centre and entanglement on the left side.

The glider started to spiral in an anti-clockwise direction with a maximum descent rate of approximately 12,6 m/s as indicated on the variometer. The proximity of the reserve parachute nappy to the glider, coupled with meteorological factors, showed that the reserve parachute was deployed at an altitude of no more than 150 m AGL. The reserve parachute became entangled in the lines of the paraglider and failed to open, which resulted in a high-speed impact with the ground.

3. CONCLUSION

3.1 Findings

3.1.1 The pilot's intention was to fly the paraglider on a private flight from Dunnottar Airfield to Delmas Airfield.

3.1.2 The winch operator observed the paraglider flying at a high altitude and broadcast to the pilot to inform him of this.

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 the basic SAHPA-approved syllabus and was issued with a valid paraglider licence by SAHPA.

3.1.5 The paraglider was reported missing to SASAR, which resulted in a search-and-rescue operation being activated.

3.1.7 The paraglider and equipment sustained minor damage during the accident sequence.

3.1.8 The ground impact marks indicated that the paraglider had been in an anti-clockwise spiral prior to impact, and according to the flight data downloaded from the variometer, had descended at a maximum rate 12,6 m/s.

3.1.9 The reserve parachute was deployed by the pilot at an estimated altitude of not more than 150 m AGL.

3.1.10 The pilot entered into a serious deviation from normal flight, resulting in his falling through the paraglider lines, which caused a line-over to the right of centre as well as entanglement on the left side.

3.1.11 The pilot was sufficiently conscious after the impact to be able to remove his helmet, and unclip his riser, leg strap and chest strap before succumbing to his injuries.

3.2 Probable Cause/s

3.2.1 The paraglider most probably encountered turbulence due to thermal activity close to the ground, and being unable to recover in time, struck the ground.

3.2.2 The paraglider spiralled in an anti-clockwise direction until impact.

3.2.3 Contributory factor: failure by the pilot to cut away the parachute and deploy the

reserve parachute timeously.

4. SAFETY RECOMMENDATIONS

4.1 It is recommended that the Director for Civil Aviation should through the relavent department advice PASA to inform all its members to use the services of Search and Rescue (SAR) to facilitate the search and rescue operations.

5. APPENDICES

5.1 None.

Report reviewed and amended by the Advisory Safety Panel 21 September 2010.

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