



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/8309	
Aircraft Registration	N/A	Date of Accident	30 May 2007		Time of Accident	1534Z
Type of Aircraft	Powered Paraglider		Type of Operation		Private	
Pilot-in-command Licence Type		Powered Paraglider	Age	39	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	31		Hours on Type	31
Last point of departure		Sundays River Mouth (S33° 42.979 E25° 51.242)				
Next point of intended landing		Cannon Rocks (S33° 44.571 E26° 33.501)				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Sand dunes at the geographical position S33° 44.104 E26° 15.080 near Alexandria in the Eastern Cape						
Meteorological Information		Wind: 230° at 15 kts; Temperature: 17°C; Cloud: 4 Octas altocumulus at 8 000 ft AGL				
Number of people on board	1	No. of people injured	0	No. of people killed	1	
Synopsis						
The powered paraglider pilot was one of a group of five pilots who departed from the Sundays River area near Port Elizabeth on 30 May 2007 on a flying tour along the east coast of South Africa, to Durban. The intended landing site on 30 May 2007 was Cannon Rocks near Alexandria in the Eastern Cape. The pilots departed at various times, with the understanding that they would all fly to Cannon Rocks, but each would use a vehicle recovery or camp out if he wished to do so and re-join the rest of the team the following day. One of the pilots failed to arrive at Cannon Rocks and the other group members were unable to establish any communication with him on his Airband handheld radio. He was reported missing to the South African Police Services (SAPS) at Alexandria on 31 May 2007. A ground search was then initiated by the SAPS that lasted for 12 days until his body was found by a member of a search party on a motorbike and the police on 11 June 2007. The body was found between sand dunes at the geographical position S33° 44.104 E26° 15.080 at Island View near Alexandria in the Eastern Cape.						
Probable Cause						
The pilot experienced a wing collapse, most probably induced by strong rotor streaming conditions that blew inland. He was unable to recover from the conditions and impacted with the ground.						
IARC Date				Release Date		

AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Wilhelm Daniel Calitz
Manufacturer : PAP
Model : 1400 R125
Nationality : South African
Registration Marks : Not applicable
Place : Island View close to Alexandria
Date : 30 May 2007
Time : +/-1534Z

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 powered paraglider pilot was one of a group of five pilots who departed from the Sundays River area near Port Elizabeth on 30 May 2007 on a flying tour along the east coast of South Africa, to Durban.
- 1.1.2 The intended landing site on 30 May 2007 was Cannon Rocks near Alexandria in the Eastern Cape.
- 1.1.3 The pilots departed at various times, with the understanding that they would all fly to Cannon Rocks, but each would use a vehicle recovery or camp out if he wished to do so and re-join the rest of the team the following day.
- 1.1.4 One of the pilots failed to arrive at Cannon Rocks and the other group members were unable to establish any communication with him on his Airband handheld radio.
- 1.1.5 He was reported missing to the South African Police Services (SAPS) at Alexandria on 31 May 2007. A ground search was then initiated by the SAPS that lasted for 12 days until his body was found by a member of a search party on a motorbike and the police on 11 June 2007. The body was found between sand dunes at the geographical position S33° 44.104 E26° 15.080 at Island View near Alexandria in the Eastern Cape.

1.2 Injuries to Persons

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

1.3 Damage to Power Paraglider

- 1.3.1 The powered paraglider sustained damage to the frame of the engine, propeller and engine mountings.

1.4 Other Damage

- 1.4.1 No other damage was caused.

1.5 Personnel Information

Nationality	South African	Gender	Male	Age	39
Licence Number	*****	Licence Type	Powered paraglider		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Declaration Expiry Date	22 May 2008				
Restrictions	None				
Previous Accidents	None				

The pilot started flying powered paragliders on 20 July 2006 and went solo for the first time on 27 November 2006 at a total of 17.19 flying hours.

At the time of the accident, the pilot had accumulated a further 14 flying hours.

The pilot had previous experience as an aeroplane private pilot and was rated on a Cessna 152 and Cessna 172 aircraft. His private pilot's licence had expired on 18 November 2000.

Flying Experience on Powered Paragliders:

Total Hours	31.0
Total Past 90 Days	3.3
Total on Type Past 90 Days	3.3
Total on Type	31.0

1.6 Powered Paraglider Information

Wing

Type	Powered paraglider
Serial Number	Not applicable
Manufacturer	PAP – 1400 R125
Year of Manufacture	2007
Total Airframe Hours (at time of accident)	36
Operating Categories	Powered paraglider



Figure1: A powered paraglider similar to that flown by the pilot in question.

Engine

Type	Ross 125
Serial Number	Not applicable
Hours since New	36



Figure 2: The Ross 125-type engine which was used.



Figure3: The hours flown by the engine since new.

Propeller

Type	Helix
Serial Number	Not applicable
Hours since New	36

1.7 Meteorological Information

- 1.7.1 The weather information obtained from the South African Weather Service for 30 May 2007 indicated the following:

Surface Analysis

There was a coastal low moving along the south coast and this would have caused a north-easterly wind at first light and a strong south-westerly wind by 1500Z.

Upper Analysis:

Upper air trough was west of Cape Town at 500 hPa.

Weather conditions in the vicinity of the accident:

No official observations are available at the time and place of the accident. The most likely conditions at the place of the accident were:

Temperature	17.0° C
Wind direction and speed	230° TN at 15 kts
Cloud (AGL)	4 octas altocumulus at 8 000 ft AGL

1.8 Aids to Navigation

- 1.8.1 The powered paraglider pilot was equipped with a Garmin Foretrex 201 Global Positioning System, which was reported serviceable at the time of the accident.

1.9 Communications

- 1.9.1 The pilot was equipped with an Airband handheld radio, which was reported serviceable at the time of the accident. The radio frequency being used at the time of the flight was 130.350MHz.

1.10 Aerodrome Information

- 1.10.1 The accident did not occur on or close to an aerodrome.

1.11 Flight Recorders

- 1.11.1 The powered paraglider was not fitted with a flight data recorder nor was it a regulatory requirement. It was, however, fitted with a Garmin Foretrex 201 Global Positioning System, from which information was downloaded after the accident.

1.12 Wreckage and Impact Information

- 1.12.1 The powered paraglider impacted with a sand dune at the following geographical position: S33° 44.104 E26° 15.080 at Island View.



Figure 4: The sand dunes over which the pilot flew prior to the accident.

1.12.2 Information downloaded from the Garmin Foretrex 201 Global Positioning System revealed that the pilot had been flying along the coast at a height of approximately 158 metres above ground level over sand dunes when he suddenly lost altitude and impacted with the ground.



Figure 5: The position of the wing in relation to where the pilot was found.



Figure 6: Where the wreckage and pilot were found buried under sand.

1.12.2 An on-site investigation revealed that the powered paraglider's frame was bent in several places, and the engine mountings and propeller were broken. This damage had been sustained as a result of impact with the ground.



Figure 7: The damage sustained on impact with the ground.

1.12.3 Further investigation revealed that the wing had a line over it and the wing surface displayed burn marks due to friction.



Figure 8: The condition of the wing when it was found.



Figure 9: The ripping and burning effect on the wing surface.

1.13 Medical and Pathological Information

1.13.1 The pilot was the holder of a valid aviation medical certificate for this type of licence.

1.13.2 The pathological report concluded the following:

“that the cause of death was determined to be:

MULTIPLE INJURIES”

There was no blood available for toxicology, alcohol or carbon monoxide tests due to the advanced stage of decomposition of the body.

1.14 Fire

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

1.15 Survival Aspects

1.15.1 The accident was not considered survivable due to the high impact forces associated with this type of accident.

1.15.2 An on-site investigation revealed that the pilot had deployed the reserve parachute. It had not been fully deployed, however, as could be seen from the fact that the handle was found at the impact site. If the parachute had been fully deployed, the handle would have been located away from the parachute.

1.16 Tests and Research

1.16.1 The Garmin Foretrex 201 Global Positioning System (GPS) was downloaded and the following information was obtained from it:

Number	Time	Track Direction	Speed (km/h)	Altitude	Description \ Comments
34	16h52 22		8		Take off
45	16h53 20		41		Set course
270	17h20 38	052	70		Attained fastest speed since take-off
313	17h27 06	051	74		Highest speed in flight
320	17h27 57	098	65	334	Highest altitude during flight – perhaps communicating with other pilot who had already landed.
362	17h33 38	122	59	194	Turns heading towards the coast
366	17h33 58	159	46	193	Flight still under control
367	17h34 02	130	24	194	Speed decreased by 22km/h within 4 seconds of GPS log. No altitude lost. It may be possible that at this time the pilot experienced a sever gust of wind.
368	17h34 07	81	55	158	Track direction changed dramatically. In 5 seconds the pilot lost 36m altitude. Speed increased by 31km/h, indicating a dive due to a possible wing collapse.
369	17h34 10	131	33	113	Track direction changed dramatically, indicating a full 360 degree rotation. Ground speed reduced by 22km/h and altitude reduced by 45m. Pilot is still in a spiral dive, diving at 15 meters per second
370	17h34 12			95m	No further data available.

1.16.2 The pilot took off at 1452Z and flew east from the Sundays River mouth towards Cannon Rocks. At 1534Z, his speed decreased by 22 km/h within 4 seconds of the GPS log but no altitude was lost. At 1534Z, his track direction changed dramatically.

In five seconds there was a reduction of 36 m in altitude. Speed increased by 31 km/h. At 1534Z, track direction changed dramatically, indicating a full 360° rotation. Groundspeed reduced by 22 km/h and altitude reduced by another 45 m.

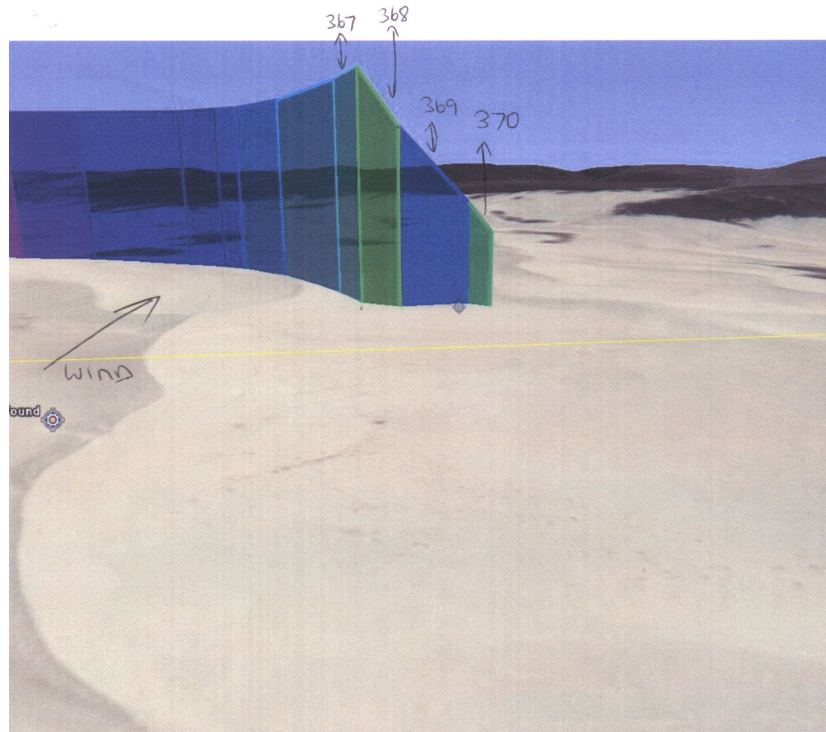


Figure 10: GPS download indicating the track and height the pilot flew.



Figure 11: GPS download indicating the track the pilot flew.



Figure12: GPS download indicating the track the pilot flew.

1.17 Organisational and Management Information

1.17.1 This was a private flight, with the pilot also being the owner of the powered paraglider.

1.18 Additional Information

1.18.1 Information downloaded from the Garmin Foretrex 201 Global Positioning System (GPS) revealed that the pilot lost 81 metres in altitude within 8 seconds, his speed suddenly increased and his direction changed dramatically, indicating a 360° degree rotation and a dive of 15 metres per second, before impact with the ground.

1.18.2 The following quote explains spiral dives in powered paragliders:

Out-of-control spirals have been one of the highest causes of fatalities.

With spiral dives, very high turn-speeds can be reached, with an increase in the acceleration (up to over 6 g) due to gravity.

Never attempt to enter a spiral dive with less than 150 to 200 metres ground clearance.

A spiral is a dangerous manoeuvre due to the risk of disorientation, high descent rate and possible loss of consciousness.

1.18.3 Wind rotors or rotor streaming

Excerpt from *Meteorology for pilots* by Mike Wickson, p 153:

Rotor streaming is a severe form of travelling turbulence which can occur downwind of a mountain range in conditions where basic mountain waves are unlikely.

As with mountain waves, a rotor zone can form just downwind of the mountains, but in certain conditions the rotor zone can then stream downwind taking its severe turbulence with the movement. The conditions necessary for this streaming to occur are stable air, strong winds at right angles to the mountain range (within 30°) for a restricted height comparable to the mountain height and for lighter winds to apply above this level. The rotors can exist from ground level up to three times the height of the mountains and sometimes move downwind. They can cause extreme turbulence up to some 50-100 nm downwind to the range.

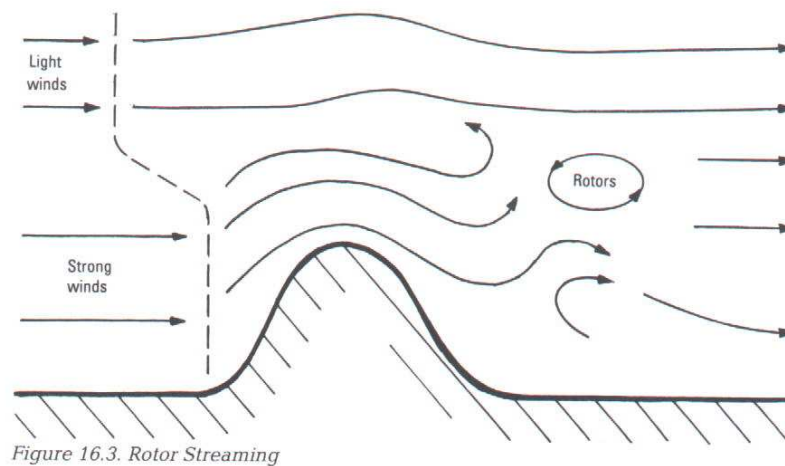


Figure 13: Rotor streaming.

1.18.4 It was found that the height of the sand dunes was approximately 150 metres and that the pilot had been flying at a height of 158 metres when he experienced the rotor wind. It was also confirmed that in order for the reserve parachute to work successfully, it must be deployed at a minimum height of 100 metres above ground level (AGL). The fact that the reserve parachute was found deployed on the ground indicates that the pilot had attempted to open it.

In addition, the fact that the handle was discovered at the point of impact shows that the parachute had not been fully deployed.

1.19 Useful or Effective Investigation Techniques

1.19.1 Not considered necessary.

2. ANALYSIS

- 2.1 According to the examination of the powered paraglider, no evidence of pre-impact failures or malfunctions that could have caused the accident was detected.
- 2.2 Flight data from the Garmin Foretrex 201GPS which the pilot had with him, and which showed information up to the point of impact, was retrieved.
- 2.4 This indicated that the pilot took off at 1452Z and flew east from the Sundays River mouth towards Cannon Rocks. At 1534Z, the flight went horribly wrong when the pilot's speed decreased by 22 km/h within 4 seconds. The data also showed that no altitude was lost and it is therefore possible that at that moment the pilot experienced a severe gust of wind. The track direction changed dramatically. Within 5 seconds, the pilot lost 36m in altitude. His speed increased by 31 km/h, indicating a dive due to a possible wing collapse. Then the direction changed dramatically, indicating a full 360° rotation. Groundspeed reduced by 22 km/h and the altitude reduced by another 45m. The pilot was still in a spiral dive, diving at 15 metres per second, when he impacted with the dune.
- 2.5 The conclusion that can be drawn from the data is that the pilot possibly flew above but behind a sand dune and experienced wind rotors over the sand dune due to the wind blowing inland from the sea. He appeared to sustain a collapse on the left-hand side of the wing which brought on a spiral dive. It would seem that there was also a line-over problem on the left-hand side of the wing at the same time as the wing collapsed. After the wing collapsed, it would have re-inflated extremely fast due to the reflex technology, and this would have caused the ripping and burning effect on the wing surface seen on the photographic evidence. The line-over would only have been possible if there had been a wing collapse in the first place. The line-over problem on the left-hand side of the wing would then have kept that side of the wing collapsed. This in turn would have caused a high-speed descent and drift downwind with the heading change as indicated by the GPS co-ordinates. The pilot was unable to recover from the situation and with insufficient height to recover, impacted with the ground.
- 2.6 It was also determined that the pilot had attempted to open his reserve parachute, as it was found deployed on the ground near his body. However, it would appear that he had been unable to deploy it fully, as the handle was found at the impact site.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot was correctly licensed at the time of the accident.
- 3.1.2 The powered paraglider sustained damage to the frame of the engine, propeller and engine mountings on impact with the terrain.
- 3.1.3 Ripping and burning effects were found on the wing surface, as well as a line-over on the left-hand side of the wing.
- 3.1.4 The pilot was wearing a full-face helmet at the time of the accident.

- 3.1.5 The pilot died due to multiple internal injuries he sustained during impact.
- 3.1.6 The wind was considered to have contributed to this accident as it caused rotor streaming over the sand dunes.

3.2 Probable Cause/s

- 3.2.1 The pilot experienced a wing collapse, probably induced by strong rotor streaming that blew inland. He was unable to recover and impacted with the ground.

4. SAFETY RECOMMENDATIONS

- 4.1 Powered paraglider pilots should increase the height at which they fly over sand dunes or mountains due to the possible risk of rotor steaming.
- 4.2 Powered paraglider pilots who wish to fly on extended trips should take more precautions and perform better flight planning when flying in unknown territory. They should also plan their trip to land at specific and identified places.

5. APPENDICES

- 5.1 None.

-END-

Report reviewed and amended by Office of the EM: AIID
September 2009