

ACCIDENT

Aircraft Type and Registration:	Airwave Sport 3-L paraglider, no registration required	
No & Type of Engines:	None	
Year of Manufacture:	2006	
Date & Time (UTC):	7 September 2006 at about 1830 hrs	
Location:	White Rocks, near Portrush, County Antrim	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - 1 (Fatal)	Passengers - None
Nature of Damage:	Minor damage to paraglider canopy	
Commander's Licence:	'Club Pilot (Novice)' - no CAA licence required	
Commander's Age:	53 years	
Commander's Flying Experience:	Approximately 100 hrs	
Information Source:	AAIB Field Investigation	

Synopsis

After takeoff from a cliff-top soaring site the pilot did not find adequate lift either to remain level or to climb. He turned towards a nearby beach to land but, due to his rate of descent, he was unable to reach the beach and landed in the sea. He appeared uninjured from the landing and, remaining in his harness, attempted to gather his canopy and climb onto submerged rocks. Owing to the high tide and strength of the swell, his efforts to gather the canopy were unsuccessful and, despite attempts by others to rescue him, he drowned before being reached by the local inshore lifeboat. The pilot was not wearing a lifejacket.

The investigation found the pilot had been properly trained, including training in emergency water landing procedures. His equipment was fully serviceable. It is

believed he was not able to soar due to his chosen flight path after takeoff which took him too far from the edge of the cliff and its associated band of lift.

Two safety recommendations are made.

History of the flight

The pilot had arrived at East Strand Beach at about 1700 hrs and had completed a short flight from a large sand dune situated on the beach. He then drove the short distance to White Rocks, a line of cliffs adjacent to the beach, where a colleague was already soaring. Whilst the pilot was preparing his equipment for a takeoff from the cliffs, another colleague arrived to do some flying. The two men had a short conversation before the second to arrive took off, flying along the top of the cliff edge

towards the east. He successfully found lift and gained height, joining the other airborne paraglider, soaring up and down the length of the cliffs.

About ten minutes later, at approximately 1825 hrs, the two airborne pilots observed their colleague take off from the western end of the cliffs, flying towards the east. The takeoff appeared normal and, once airborne, the pilot flew parallel to the edge of the cliffs, but about 20 m from the cliff face, over the sea. The paraglider could be seen to descend as it progressed to the east and the pilot continued in this direction for approximately 650 m before starting a wide turn to the left, away from the cliff face. The paraglider canopy was by this time below the level of the cliff tops and continuing to descend. The pilot continued the turn so that he was heading back towards the cliffs in a westerly direction, by which time he was descending even more rapidly. A few seconds later the pilot landed in the sea, about 20 m out from the cliffs. The landing appeared controlled and the canopy continued to fly over the top of the pilot, landing in the water above some submerged rocks near the base of the cliffs. The pilot remained in his harness and no attempt to release himself was evident, either before or after his landing. The pilot appeared uninjured and could be seen trying to collect the canopy together and climb onto the submerged rocks. These attempts were hampered by the depth of the water and the large swell.

The two airborne pilots had witnessed the whole event and continued to fly above the scene, talking to each other over the VHF radios they carried. The pilot in the water was not carrying a radio and they were not able to communicate with him. They believed, however, that from his actions, he was not, at that point, in difficulty. After about two minutes, when the pilot could still be seen attempting to recover his canopy, one of the airborne pilots decided to land at East Strand Beach to

try to make his way round the base of the cliffs to assist him. After landing, he found he was unable to get round the cliffs due to the depth of the water and the size of the swell and, concerned that his colleague was now getting into trouble, made his way to a lifeguard station on the beach to raise the alarm. Two canoeists in the sea off the beach also attempted to get to the pilot but, again, were prevented from doing so by the size of the swell.

The airborne pilot was getting increasingly concerned about the pilot in the sea, who had remained in his harness and was repeatedly being tipped head down in the rough water, his harness floating each time to the surface. Realising the other pilot was unable to get round the base of the cliffs, the airborne pilot landed on East Sand Beach and got a lift from one of the life guards back to the top of the cliffs. He intended to find a way down the cliffs to the sea but, on getting back to the top, he could see the pilot in the sea floating face down in the water.

The Coastguard received an initial call about the accident at 1835 hrs. Both the all-weather and inshore lifeboats were launched from Portrush and were quickly at the scene, although they too were hampered by the sea swell in trying to reach the pilot. A team from the Coastguard attended, to prepare an attempt at a rescue from the cliff tops and a search and rescue helicopter was scrambled. The inshore lifeboat was finally able to reach the pilot and he was taken on board the main lifeboat at about 1920 hrs UTC to be taken to a waiting ambulance in Portrush Harbour. Attempts to resuscitate the pilot were unsuccessful.

Equipment

The pilot was using a Sup Air Profeel XC2 harness, which he had purchased new in May 2006, and an Airwave Sport 3-L paraglider, which he had also purchased new a few months before the accident.

The Profeel XC2 harness, (Figure 1), was fitted with shoulder, lap and leg straps to secure the pilot. The shoulder straps were attached to the lap straps and both the lap and leg straps were fastened using quick release latches, which could be released by simultaneously pressing two tabs on the latch. A reserve parachute was carried in a pocket on the lower right side of the harness and an additional pocket was provided on the rear of the harness to allow stowage of personal items. The harness incorporated a 'Bumpair 17' back protection system, which was designed to provide cushioning in the event of a hard landing. The 'Bumpair 17' consists of a 40-litre multi-cell shaped foam 'cushion' extending from the pilots shoulders around the base of the harness and under the pilot's thighs, reaching its maximum thickness at the base of the spine and under the pilot's thighs. The foam is designed to release air and compress at a controlled rate, to minimise shock loading of the spine and legs.

The manufacturer's handbook provided the following advice regarding flying over water:

'Do not under any circumstances use any air-based protection (Bumpair, Cygnus-type Airbag, or Airtec) if there is any risk that you will land in water. If you land in water using a BUMPAIR, there is a real danger that its buoyancy under the base plate and behind the pilot's back will lead to the pilot's head being held under water.'

..... flying over water, we recommend the use of a life jacket equipped with a collar which will keep the pilot's head above water in the case of a loss of consciousness'

The Airwave Sport 3-L is certified as an intermediate level canopy with a minimum total flying weight of 95 kg and a maximum of 120 kg.



Figure 1
Profeel XC2 harness

In addition, the pilot was also carrying a 'flight deck', a detachable pouch attached to the paraglider harness containing a Garmin GPS, a digital anemometer and a Digifly portable variometer and flight computer.

The pilot was wearing a helmet but was not wearing a life jacket.

Technical investigation

During the rescue attempt the life boat crew were forced to cut the paraglider lines and harness straps to lift the pilot from the water, and to clear lines fouling the boat's propeller.

Examination of a video clip taken by one of the pilot's colleagues confirmed that the canopy was fully inflated and free from any tears or rips prior to the water landing. On examination, the canopy was found to have several large gashes in the material which were believed to have been caused by snagging on rocks whilst the paraglider was in the sea. The paraglider lines showed no evidence of pre-accident failure or unusual wear.

The harness showed no defects which would have contributed to the accident, or which would have prevented the pilot releasing himself from the harness whilst in the water.

Nether the pilot's GPS nor his flight computer had recorded any information relating to the accident flight.

Weather

Weather information was provided by witnesses, the Coastguard and the Met Office. From these sources it was determined that at the time of the accident there was a northerly wind of about 5 to 10 kt blowing onto the cliffs. Visibility was good and there was no cloud below about 2,000 feet amsl. The sea was subject to a spring

tide, giving higher than normal sea levels, and the sea state was estimated to give rise to 1 metre waves every 5 seconds. The air temperature was about 14°C.

Pilot's background

The pilot purchased a paraglider in 2001 and began flying, but without undertaking any formal training. In April 2002 he started training with a British Hang-gliding and Paragliding Association (BHPA) registered paragliding school and on 26 July 2003 qualified as a Club Pilot (Novice). This training included instruction in emergency techniques should a pilot land in water.

The pilot then continued to fly regularly from various sites around Northern Ireland and, occasionally, abroad. No log book has been found but it is thought he had flown about 100 hours by the time of the accident. He was considered to be a cautious pilot and colleagues commented that he would often position himself laterally too far from the terrain to achieve the best lift. He undertook no other formal training since qualifying as a Club Pilot although he had received coaching on occasion from approved BHPA qualified club coaches.

Medical

The post-mortem examination found no indications that the pilot was incapacitated prior to entering the water and determined that he had died due to drowning. There were no medical indications that he would have been unable to operate the release mechanism on his harness.

The pilot had complained to the other pilots that day that he was feeling tired. He worked as a plant operator at a local sports complex where, for a number of weeks due to staffing problems, he had been working additional hours. During the last two weeks before the accident he had worked in excess of 80 hours per week.

East Strand Beach and White Rocks ridge soaring sites

The East Strand Beach soaring site consists of a large sand dune approximately 100 feet high. This would normally be used when the wind was above about 12 mph and would give pilots the opportunity to soar up and down the length of the dune and, if the conditions were correct, to soar up to a nearby line of cliffs known as White Rocks.

White Rocks provided the second site and would normally be used in lighter wind conditions, typically below 10 mph. The cliffs rise almost vertically from the beach below to a gently sloping area about 140 feet above, on which there is a main road. Pilots used two sites to launch their paragliders from this sloping area, situated between the cliff edge and the road. If the wind was north-westerly the preferred launch site was about 240 m from the western end of the cliffs. If the wind was from the north or north-east the preferred launch site was at the western end of the cliffs.

Further inland, to the south of the road, the cliffs continued to rise again vertically for about a further 80 feet. At the base of the cliffs low tide exposes a gently sloping beach and some rocky outcrops. At high tide the sea comes up to the base of the cliffs but, depending on the height of the tide, is generally low enough to allow an adult to stand chest deep within about 20 m of the cliffs.

The three pilots were the only pilots known to have used the site on White Rocks and had begun using it about two months prior to the accident.

Soaring technique for White Rocks

Owing to the restricted area available and wind limitations, pilots would need to launch the canopy by

the 'reverse launch' technique. This involved turning to face the canopy, pulling on the risers to inflate the canopy and bringing it into the air above the pilot's head. The pilot then checked the canopy was inflated properly and the lines were not tangled before turning himself into wind and running until he became airborne.

Once airborne at this site, the pilot needed to position the paraglider so that it was able to fly in the rising air above the cliff line. This required the paraglider to be flown above the edge of the cliff, and where there was sufficient lift generated, the pilot would be able to climb and soar along the cliff line. If the conditions allowed, pilots would be able to climb high enough to soar above the higher cliffs on the southern side of the road as well. Where there was insufficient lift generated, the pilot would have to descend away from the cliffs to make a landing on the beach below. When the tide was in, this limited the available beach area exposed for landing to that at East Strand Beach, about 200 m to the west of the cliffs.

When using the westerly launch site, pilots needed to turn immediately east in order to gain lift along the cliff line. However, should they gain insufficient lift to soar above the cliffs, in order to ensure they could reach East Strand Beach they were required to make a 180 degree turn by a pre-determined point. This point was recognisable as it was coincident with the eastern takeoff point, an obvious rise in the ground about 240 m from their westerly takeoff point.

BHPA publications

The BHPA Pilot Handbook is summarised on its front cover as '*The complete guide to paraglider and hang glider training and advancement*' and is the standard reference book recommended to BHPA members. Although it is not provided as part of the membership

of the association, it can be purchased from the BHPA head office.

Chapter 18 deals with emergencies in flight and states the following about landing in water:

'The sad reality is that landing a hang glider or paraglider in water will almost always result in the pilot drowning..... An unplanned arrival in winter in a heavy swell off the British coast, dressed in full flying gear and with nobody on hand to effect an immediate rescue is going to be fatal. How good a swimmer you are is of absolutely no importance, as nobody can swim in a hang-gliding harness or wrapped in paraglider lines.

The main reason that paraglider pilots rarely survive a water landing is that they become entangled with the canopy and its lines. So the priority is to get clear of the equipment. Do not be tempted to hang onto it, especially if you have come down in the sea, where there may be waves.

To prepare for the landing, remove your gloves, sit back in the harness and loosen your leg and chest straps. If you are using quick-release buckles, these can be fully released just before splash down.

Try to land downwind, allowing the canopy to over-fly away from you. Do not flare, as this may cause the canopy to land on you. Having landed, release yourself from your harness if necessary and swim away'

'Water landings – paragliders

Instructors must stress the probability, except within the most strictly controlled environment, that a water landing is not survivable and must be avoided at all costs. Pilots should, if flying near water, make sure that a safe dry landing is within easy reach at all times.

If, however, it is impossible to make a dry landing (even with the risk of injury) then, the real danger lies in the potential for entanglement with the paraglider suspension lines. It is therefore imperative to get clear of the paraglider as quickly as possible. On approach sit well back and unclip the chest strap and loosen the leg straps. On entering the water release the leg straps (or riser-to-harness connectors) and FLOAT clear with the minimum of movement. If an inflatable life jacket is worn it should be inflated.'

It is not known how much study the pilot had made of the BHPA publications.

Previous events

The last recorded fatal accident of this nature recorded by either the BHPA or the AAIB occurred in February 2002 at Calpe, Spain. The pilot landed in the water between 5 and 10 m from the shore line but was unable to release himself from his equipment and drowned. The harness was fitted with foam protection for the lower back but it was an older design based on a mountaineering harness and did not make use of quick release buckles. This made it difficult for the pilot to release himself from the harness whilst in the water.

The BHPA Technical Manual provides guidance to instructors. Section 2, Chapter 1, Page 9 deals with landing emergencies and states:

Analysis

It is evident that after getting airborne the pilot flew too far from the cliff face to benefit fully from the band of lift. This was consistent with his cautious approach to flying, commented on by his colleagues. His likely desire to position himself away from the cliff face on this occasion denied him the necessary lift required to either maintain, or gain, height.

The situation was compounded by the wide turn made by the pilot to head back to East Strand Beach, which took him further away from the lift band and so increased his rate of descent. This, combined with the fact he had gone some 400 m beyond the normal turnback point, left him with no realistic chance of reaching the beach.

The weather and the canopy were both suitable for the pilot's level of experience and, in the absence of any identifiable technical or medical factors, it is unlikely that there were any problems encountered by the pilot that might have affected his ability to control the paraglider. It is, however, possible that the pilot's decisions were adversely affected by the level of fatigue he was reportedly suffering due to his long working hours.

The pilot's training, as part of the BHPA, would have included specific details on the hazards of water landings and the techniques to adopt in order to improve the chance of survival. This information was also available in various books which the pilot would have been able to obtain, although it is not known if he had done so.

Once the pilot had entered the water, the witnesses did not see him attempt to release his harness. His observed attempts to gather the paraglider, suggest that the pilot was concerned about losing this valuable equipment had he done so.

The harness lap and leg straps would have made swimming difficult and would have hampered the pilot's attempts to climb onto the submerged rocks. The buoyancy from the Bumpair air bag in the harness would also have tended to push the pilot's head underwater, this being compounded by the pilot's lack of a life jacket. These facts, together with the sea state presented by the spring tide and prevailing weather, resulted in a set of circumstances that significantly increased the likelihood of drowning.

Comment

None of the pilots flying at White Rocks at the time of the accident was wearing a life jacket. The pilots interviewed stated that they found them uncomfortable and believed that they would always be able to land either on the cliffs or East Strand Beach and therefore chose not to wear them.

Safety Recommendation 2007-075

It is recommended that the British Hang Gliding and Paragliding Association (BHPA) highlights this accident to its members and reinforces the importance of using the appropriate safety equipment.

During the course of the investigation AAIB Inspectors were concerned about the proximity of the White Rocks paragliding site to the road. The layout of the road means that drivers might easily be distracted by the sudden appearance of a paraglider in close proximity to their vehicle.

Safety Recommendation 2007-076

It is recommended that the Ulster Hang Gliding and Paragliding Club, in co-operation with the Police Service of Northern Ireland, reviews the suitability of White Rocks as a paragliding site and advises its members accordingly.