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BHPA Incident Report: GBR-2020-16524

INCIDENT

Aircraft Type:	Paraglider: Air Design Rama Flex size M (serial number XPMP132009AC). Paramotor unit: "Flat Top" with Vittorazi Moster Classic engine and 1.3m carbon propeller).
Certification:	Paraglider not certified under EN 926-2.
Location:	A hillside adjacent to Gryfe Neuk Nursery, near Kilmacolm, Renfrewshire.
Date and Time:	2nd June 2020, approximately 11:00 UTC.
Type of Flight:	Local flight.
Persons Involved:	Pilot A.
Injuries:	Cause of death listed as multiple injuries, due to fall from a height whist paramotoring.
Nature of Damage:	Damage to the suspension lines of the paraglider. Damage to the paramotor.
Pilot's Rating/Licence:	None / unknown (not a BHPA member).
Pilot's Age:	77
Pilot's Experience:	Approximately 300 hours powered paraglider (paramotor) airtime logged since 2001.
Information Sources:	Statements from Witnesses B and C. Data from Pilot A's flight logbook. Wing inspection report from an independent expert. Aftercast information from the Met Office. Soaring weather aftercast provided by the UK RASP voluntary open weather service (www.stratus.org.uk). Static and video camera footage from Scottish Police.

1.0 Synopsis.

Pilot A launched his powered paraglider from a hill close to his home near Kilmacolm. He was seen to power-up to take off and get airborne. Pilot A's paraglider was seen to fly into wind gaining height up the hillside for between 30 seconds to a minute before it suffered a collapse and Pilot A impacted the ground, sustaining fatal injuries.

2.0 History of the flight.

Pilot A set up his powered paraglider from an area of hillside near the bottom of his usual take-off hill, approximately 20 to 30m from the road and access gate. The conditions were reported to be bright and clear with very dry land following an extended period of little rain. The wind was reported to be westerly or southwesterly.

Pilot A was seen to take off with the engine running at full power, heading into wind. He gained height, the wing orientated in a westerly or southwesterly direction into wind, crabbing up the hillside. The wing was seen rolling from side to side and Pilot A made control inputs as if trying to correct the roll. Between 30 seconds and one minute after take-off, Pilot A's paraglider was seen to experience a collapse and descend rapidly from about 30 feet above the ground. Pilot A impacted the ground, and was attended to by Witness B. The Emergency Services were summoned. Pilot A died from his injuries.

3.0 Focus.

Based on the information available, the Investigation considered the flying area and local flying conditions; Pilot A's experience and currency; his equipment; and Pilot A's flight leading to his impact with the ground.

3.1 The flying area and local conditions.

The incident site is a southerly or south-southeasterly facing hillside 3km to the south of Greenock, situated within Glasgow CTR (Class D controlled airspace from ground level to 6,000ft). Approximately 650m to the west of the flying area used by Pilot A are the Gryfe reservoirs. The hillside has a number of undulations and steeper grassed areas. The take-off area used by Pilot A is a gently sloping area of grassed hill that falls more steeply as the hillside rolls to a southwesterly facing direction, towards an area of marsh grasses. The hillside gradually falls to the road which runs approximately east-west. On the south side of the road is a copse of trees, dwellings and agricultural buildings.

The conditions stated on the Met Office Aftercast on the incident day in the local area were as follows:

> "… light winds of around 5 to 10 knots. The wind direction is difficult to determine as all the local stations are reporting differing directions, additionally local topography would also have an influence on the direction at the incident site. However, from the reports it is reasonable to suggest that the wind direction would be generally between 230 and 320 degrees true.
>
> Visibility would be good, in excess of 10Km. There would initially be little cloud across the area, as evidenced by Bishopton and Prestwick only reporting Few at 4000FT at 1200UTC. During the afternoon, cloud would gradually increase across the area from the north but all of this was above 8000FT AGL."

Witness B reported that on the incident day it was bright and clear, and the field was "as dry as a bone". They noted that the wind was not blowing up the hill, but it was coming from the left-hand side when looking up the slope (i.e. coming from the direction of the Gryfe reservoir). This is consistent with the Aftercast. The air travelled over areas of undulating ground before reaching the take-off area selected for use on the incident day by Pilot A. The take-off location would be in the lee of the upwind trees, which would disrupt the airflow and shelter the immediate take-off area.

RASP historical data records that for the incident area, the thermal updraft velocity was between 300 and 400 ft per minute. The Investigation determined that rising thermic air with associated turbulence would be expected to develop on the incident day and increase in strength with ground heating as the sun gained its maximum elevation. Because of the topography of the local area and the dry ground conditions, turbulent thermic air close to ground level would be expected.

Video footage from the Police helicopter shows Pilot A's wind direction indicator planted in the ground near to his take-off point. It is evident that the wind direction is southwesterly at the time the footage was taken (at 12:35 and 40 seconds), approximately 35 minutes after the incident.

In their statement* Witness C reported that the wind was "sustaining at approximately 20mph with

* The incident date referred to in Witness C's statement is Tuesday 6th June 2020. It is assumed that this date was given in error.

gusts coming from a south of west direction". The direction is consistent with the Aftercast. Witness C declares themself to be an experienced and qualified sailor and the Investigation considered the stated windspeed and direction information to be pertinent. This wind speed described by Witness C points to local conditions at ground level being quite strong for powered paragliding and potentially demanding for pilots.

The Investigation determined that prevailing local conditions were a significant factor in the incident.

3.2 Pilot A's experience and currency.

Pilot A's flight logbook shows that he made his first unpowered paraglider flight in August 2000, and his first powered paraglider flight in June 2001. Pilot A recorded approximately 300 hours' flying until his last logged flight on 5th June 2019. Pilot A logged ten flights in 2018 and accumulated just over 5 hours' airtime. In 2019, he logged three flights totalling 1hr 15 minutes in the air.

Witness B had known Pilot A for many years and stated that Pilot A regularly used the hillside for launching his powered paraglider. Witness B reported that Pilot A had been ground handling his wing on the hillside two days before the incident.

From the available evidence, the Investigation determined that Pilot A was an experienced powered paraglider pilot. However, he was not in current practice as his last logged flight had been almost a year before the incident. A period of inactivity of this duration would lead to a general decline in proficiency and a reduced facility at controlling the wing in turbulent conditions and when responding to departures from normal flight. The Investigation found that Pilot A's lack of currency was a contributory factor in the incident.

3.3 Pilot A's equipment.

3.3.1 Paraglider wing.

Based on a desktop calculation, Pilot A's total weight in flight on the incident day was calculated at 112 kg (73 pilot, 6kg wing, 27kg paramotor and harness, and an allowance of 6kg for fuel and ancillary equipment). He was not carrying an emergency parachute. The total weight in flight is within the manufacturer's specified take-off weight of 108 - 135kg for the Rama-Flex M. The paraglider manufacturer Air Design declares the Rama-Flex as "designed for the active beginner pilot who has goals to continue to expand their flying experiences, bridging the separation between a true beginner wing and an intermediate performance wing… … and is truly designed for all pilot levels."

The paraglider was inspected by an independent expert who produced a report. The wing was reported to be in good condition with a small amount of damage to the canopy. The risers on the left-hand side of the wing had been cut in the incident or subsequent rescue and the overall suspension lengths could not be verified. On the right-hand side of the wing, three outer lines (forming the stabilo) were found to be long by two centimetres. The expert stated that this was "unlikely to have had a significant impact on the performance and safety of the wing". The control lines were noted as being slightly long, but this was "unlikely to have had a significant impact on the handling". From the measurements capable of being taken, the expert concluded that there was no reason to suggest that the trim of the wing had an impact on the performance in flight.

3.3.2 Paramotor.

The paramotor comprises of a Vittorazi Moster Classic direct drive two stroke engine with a pull start and a 1.3m anti-clockwise rotating carbon fibre propeller. This engine was fitted to a "Flat Top" paramotor frame and cage, incorporating a pilot harness. The paramotor had been modified to include an engine priming system, and a throttle lock device. A pannier bag was fitted to the pilot's left-hand side of the paramotor unit suspension arm.

A visual inspection of the paramotor and harness was performed. The unit was old but appeared to have been maintained in serviceable condition prior to the incident. Damage to the paramotor unit

was evident. There was no evidence of failure of metal parts or structural webbing tape that would indicate an airborne structural failure.

The paramotor propeller guard cage ("the cage") was received in its five demountable sections and was assembled for inspection. Two areas of the cage showed damage consistent with the propeller striking the cage when under power.

The upper section cage connections to the engine chassis did not exhibit any damage. The left-hand side suspension arm was bent rearwards by approximately 2.5cm. On this arm there was evidence of abrasion. On the right-hand side arm there was evidence of abrasion once again, but to a lesser extent than the left-hand side.

The cage did not exhibit damage typically found following a high energy vertical descent impact with the ground. There was no evidence on the cage that suggested it was involved in the initial impact or had met the ground first.

The propeller damage to the cage indicates that the propeller was turning under power when it struck the cage. Witness B reported that the "machine was revving throughout". There was no report of engine failure or an abnormal engine sound. Witness B had observed Pilot A fly on previous occasions and was familiar with the activity and the normal engine noise.

The Investigation determined that the flying equipment was of suitable type. Minor line length variations identified on the paraglider were unlikely to have contributed to the incident. Whilst equipment failure could not be fully ruled out, the evidence presented indicated that it was unlikely to be a causal factor.

3.4 The incident.

Witness B reported that Pilot A usually drove his equipment to his normal take-off area, a distance of approximately 200m up the hillside from the road and access gate. However, on the incident day, his vehicle was reported as being out of commission. The Investigation took the view that Pilot A chose to use this new take-off area because it was easier to get to without a van to carry equipment up the hill to the normal spot for take-offs and landings.

From their position at the roadway, Witness B observed Pilot A launch from an area of hillside within 20m of the road and access gate (the approximate launch location is shown on Figure 1).

Fig. 1 (above). View from the approximate impact area looking south-southeast towards the launch point and road.

Witness B observed the flight from the time when Pilot A was running under his wing to get airborne. They reported that they had no concerns during the initial take-off and that the engine was on "full" during the flight. They described the track that Pilot A made, which is illustrated in Fig. 2 (below).

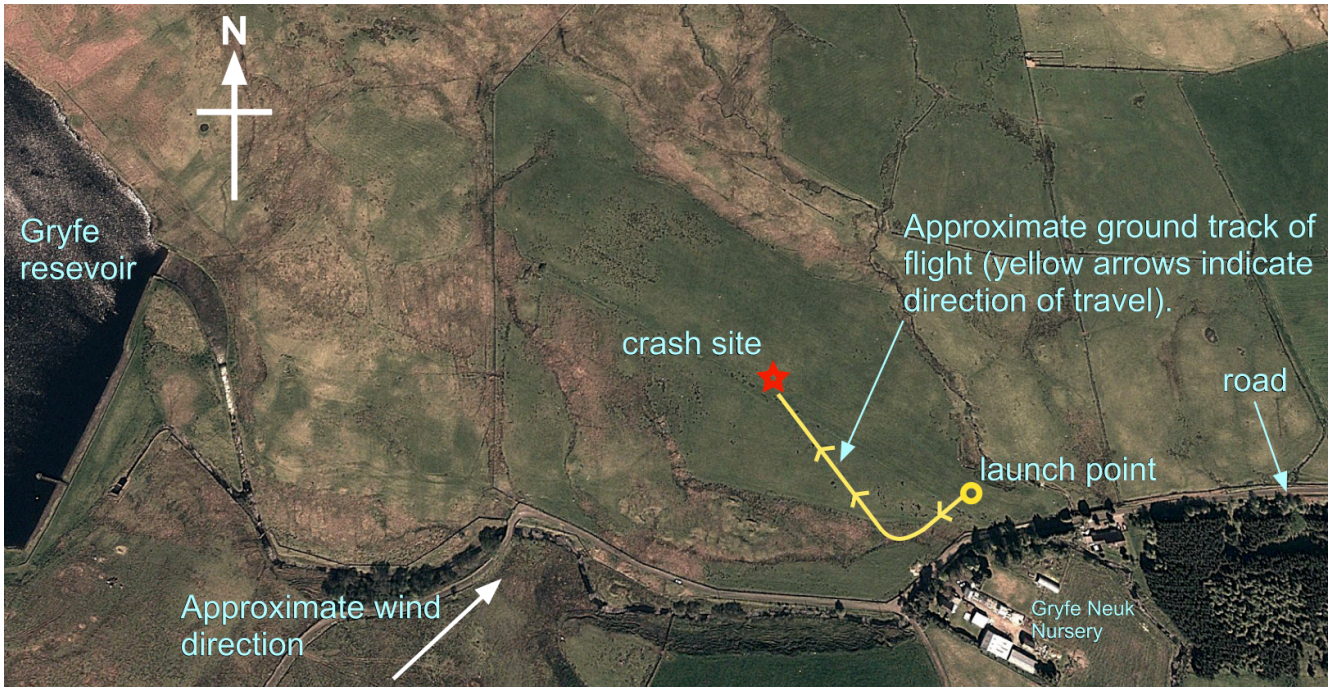

Fig. 2 (above). Background image source - Google Earth (imagery date 27th April 2011).

Witness B saw Pilot A "going up sideways" and described Pilot A's paraglider as facing into wind throughout the flight but being carried up the slope instead of making forward progress into wind. They noted that the wing was rolling from side to side and could see that Pilot A was making control inputs in what they described as an attempt to correct the rolling movement of the wing. Witness C (from their position on the road to the east) observed the wing oscillating before it dropped out of view. It is evident that Pilot A's wing had encountered an area of turbulent air.

Witness B observed the left-hand side of the paraglider collapse and Pilot A descend quickly to the ground. They attended the scene and found Pilot A on his side with the wing further up the hill. Witness B was aware that the engine was not running when they reached Pilot A and believed that the engine had stopped at the time of impact.

The post-incident condition and damage to the paramotor unit is commensurate with a high forward speed impact rather than a rapid vertical descent. This suggests that Pilot A was turned towards the hill when the paraglider wing collapsed on one side, resulting in a high-speed approach (to the ground) as he swung under the wing, with a downwind component to the direction of travel. The injuries to Pilot A's legs support this, suggesting that his legs bore the brunt of the impact force.

Pilot A's selected set up and launch area for the incident flight was in the lee of the copse of trees, and therefore sheltered from exposure to the airflow and meteorological conditions. The Investigation determined that once Pilot A was airborne and away from shelter of the trees, he encountered thermic activity and associated turbulent air which led to a departure from normal flight. His proximity to the hillside was such that he was unable to regain control before impacting the hill.

4.0 Findings

The Investigation concluded that the incident occurred because Pilot A lost control of his powered paraglider in turbulent air. His height above ground was insufficient for recovery to normal flight before he impacted the ground, sustaining fatal injuries. Pilot A's decision to launch from the chosen area in the prevailing conditions was the precipitating factor that led to the incident.

5.0 Recommendations.

Pilots should be reminded through the BHPA's "SkyWings" magazine not to let their choice of take-off location be determined by convenience or any factor other than suitability in the prevailing weather.