British Hang Gliding and Paragliding Association

BOARD OF INQUIRY

REPORT

Investigation of a Hang Glider accident
which occurred at the Long Mynd
on 13th March 2005
in which the pilot
was fatally injured

Introduction

On 13th March 2005 the British Hang Gliding and Paragliding Association (BHPA) received reports of an air accident at the Long Mynd which had resulted in the death of a hang glider pilot. The BHPA is required by the Air Accident Investigation Branch of the Department for Transport to carry out an investigation and produce a report under its delegated authority. The BHPA convened a Board of Inquiry under President Mark Dale and members Glyn Charnock and Jeff Hoer, with authority to investigate the accident and submit a report to the Flying and Safety Committee (FSC) of the BHPA for ratification.

BHPA investigation serial number: IR 05/021

Summary

At approximately 14:30 on Sunday 13th March 2005, an inexperienced CP (Tow) qualified hang glider pilot making a ridge soaring flight at the Long Mynd lost control of his Avian Elan glider in a turn. The glider completed at least two rapidly descending 360 degree turns before impacting the hill. The pilot subsequently died.
The investigation found that the pilot had previously lost control of a hang glider in a turn, was not qualified to fly from a hill, was probably attempting a top landing using an inappropriate approach method, had only flown twice in the five months since qualifying and was making his first flight on an unfamiliar glider.
The Board concluded that the cause of the incident was that the very inexperienced tow pilot with a low level of currency lost control of the unfamiliar hang glider whilst engaged in activities he was neither trained nor qualified to perform.

This Document is confidential until ratified.

Date ratified by the BHPA Flying and Safety Committee: 17th November 2005

Contents

THE STRUCTURE OF THE REPORT

The structure of this report conforms to that recommended in the BHPA Technical Manual and is intended to follow the principles pertaining to AAIB reports. It is divided into four sections plus the Appendices:

Section 1 - Factual information

Section 2 - Analysis

Section 3 - Conclusions

Section 4 - Safety Recommendations

Date: 18.11.05 Signed

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SECTION 1 - FACTUAL INFORMATION

1.1 History of the flight

The pilot, who was a student at the University of Birmingham, started training as a hang glider pilot at a hill school towards the end of 2003. He and a fellow student from the university completed four days of practical instruction. After a six month gap they continued their training at a tow school. During their training here they jointly purchased an Avian Elan hang glider which the tow school had serviced and modified. The pilot used this glider for the last three days of his flying at the school, where he gained his HG Club Pilot (Tow) qualification on 6th September 2004 after seven further days of instruction. (During a training flight on 4th September 2004 he recorded 'got into a 360 out of control for a time, recovered to land well'. His glider co-owner who witnessed this describes this event as 'very scary', being very nearly a spiral into the ground, the pilot just levelling the glider before landing.)

Since completing the CP (Tow) the pilot and his co-owner had attended a couple of club nights at the Long Mynd club. The pilot had flown twice: on 14th November 2004 (at the Long Mynd) where he made several soaring beats before bottom landing. The approach to the bottom landing (in the sloping landing field) was misjudged and, running out of room, he turned, impacting downwind after approx 270 degrees and breaking the glider uprights. He next flew on 5th December 2004, again at the Long Mynd, where he made his first top landing (crabbing in from the South).

On Sunday 13th March 2005, the pilot, the co-owner pilot and a more experienced member of the University of Birmingham Hang Gliding Club travelled to the Long Mynd site, along with a Senior Coach. They arrived on site at approximately 10:30. The pilot and his co-owner had with them an Avian Elan hang glider belonging to the club ('Club Elan'), as their own glider (the 'Joint Elan') had been damaged the day before in a ground looping incident whilst they were rigging it. Neither of them had flown the 'Club' Elan before.
The third university pilot, who had his own glider, had flown the 'Club' Elan before it had been placed in storage a year previously and had found it hard to turn. Therefore, after it was rigged for flight, an experienced Long Mynd club member (a Club Coach) flew it, examining how it responded in turns and reported that he was satisfied that it flew correctly. The co-owner (who by this date had amassed four to five hours experience) then had a flight on it and after top landing also reported that he was satisfied with the way the glider flew. At about 14:20 the pilot then took off for his first flight on this hang glider, and flew left to the south of the take off area. After five to ten minutes he was seen flying back north along the ridge at about 200 feet above take off, before passing in front of the take off area just to the right and north. His fellow University club pilots and a coach, thinking that the pilot was preparing to top land, began walking to a position to observe his approach. As the pilot passed on the hill side of some paragliders he began a right hand turn towards the hill which became quicker and tighter. Pilots witnessing this were immediately alarmed by the low altitude. The hang glider completed at least two rapidly descending 360 degree turns before it impacted into the hill. Other pilots ran immediately to offer assistance. The hang glider was found inverted. The pilot was removed to facilitate first aid and emergency services were summoned with the Air Ambulance attending. The pilot subsequently died.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	1	-	-
Serious	-	-	-

Minor / None	-	-	-

1.3 Damage to the aircraft

The Avian Elan hang glider had both uprights broken. The inboard left hand leading edge had been bent inward and there was minor bending to the keel. All of this damage had occurred during the ground impact.

1.4 Other damage

The full face helmet worn by the pilot was substantially damaged.

1.5 Personnel information

The pilot was a male 25 years of age and a student at the University of Birmingham. He was 193cm (6'4") tall and weighed 75kg (12 stones). He had qualified as a BHPA HG Club Pilot (Tow) on 6th September 2004.
He did not keep a log book. (During training he had made some notes in the log section of his Training Record Booklet.)

1.6 Aircraft information

The aircraft was an Avian Elan hang glider. It had been stripped down, rewired and serviced by the manufacturer in August 2002, and had only been flown once since. It had been in dry storage since. It was donated to the University Club. Although it was an old glider, it was in good condition.
The Avian Elan was only made in one size, with a clip-in weight range of 55 to 90 kg.
The hang glider was not wearing a red ribbon to identify the pilot as inexperienced.
The harness was a 'Southern Airsports' stirrup type.

1.7 Meteorological information

The Long Mynd site has a remote weather station which kept a data log of the wind and some local conditions. The conditions throughout the day were overcast with a westerly wind. At 1450 hours, it was reading 13 to 19 mph, average 15 mph West. These were easy soaring conditions that were allowing both hang gliders and paragliders to fly and top land.

1.8 Aids to navigation

Not applicable.

1.9 Communications

N/A

1.10 Aerodrome and approved facilities

The Long Mynd site is a ridge approximately four miles in length, running north to south, which is flown by gliders on the westerly side. There is a sailplane gliding club to the south of the hang glider and paraglider take off area. The whole ridge of the hill is flown in both northerly and southerly directions. The take off area can also be top landed and there is a designated bottom landing area. The site is for qualified hang glider and paraglider pilots of BHPA Club level and beyond. On 13th March 2005 the site was busy, with about forty paragliders and ten hang gliders on site. At the time of the accident there was about twenty five paragliders airborne and four or five hang gliders. These gliders were spread along the length of the ridge, at heights varying from ridge level to seven hundred feet.

1.11 Flight recorders

N/A

1.12 Wreckage and impact information

The impact area was hillside with partial coverings of grass, gorse and bracken.
The glider had impacted more or less wings level, heading downwind, and had probably been levelling out. (The pilot and control frame had taken the brunt of the impact) After impact the glider had flipped inverted.

1.13 Medical and pathological information

The report of the post-mortem indicated the pilot died from chest injuries.

1.14 Fire

No fire.

1.15 Survival aspects

Assistance was given to the pilot immediately. Contact was made with the emergency services who gave advice on procedures on the phone. The Air Ambulance and Paramedics attended.

The impact area consisted of hillside grass, rough bracken and gorse with no apparent rock areas.

The helmet was damaged with the outer shell broken around the jaw area but with little evidence of compression to the crown area foam. It had been purchased new in November 2004. It was marked as "CE mark EN 966 Certified for airborne sports".

No emergency parachute was carried.

1.16 Tests and research

N/A

1.17 Organisational and management information

N/A

1.18 Additional information

The accident hang glider (club Elan) was rigged and trimmed at the standard settings.

The Avian Elan hang glider ('joint Elan') previously flown by the pilot had been altered from the standard manufacturer's build configuration. The tension strop had shrunk, which had the effect of increasing the nose angle. A shackle had been added, but even with this fitted the cross tube pivot centre was 21mm further rearward than standard. (This would have had negligible effect.) The hang point had been moved forward 7 cm (2.5 inches) from the standard trim position, and the control frame base-bar had been rigged 24.3cm (approximately 10 inches) further forward than standard.

1.19 Useful or effective investigation techniques

N/A

SECTION 2 - ANALYSIS

It was clear from the evidence set out in the 'Factual Information' that the accident was the result of the pilot losing control of the hang glider during a turn, resulting in an uncontrolled continuous diving turn. The Board considered both the initial turn and the loss of control.

THE MANOEUVRE

The Board considered the turning manoeuvre. When ridge soaring, all turns are made away from the hill, so as to keep the pilot in front of the hill and in the lift band. Turning right, towards the hill, from the position of the glider at the time of the turn (in front of the ridge, just to the North of the top landing area) is unusual.

The initial turn may have been uncontrolled. The Board considered this possibility:
Hang gliders such as the Elan have no mechanical systems, so no such 'mechanical failure' cause was possible.
A hang glider will stall if flown too slowly – but it is extremely unusual for a hang glider to drop a wing when flown too slowly.
Meteorological turbulence could cause a hang glider to start to turn. There were no reports of the air at the time of the accident being rough, so the Board considered this unlikely.
An encounter with wake turbulence from other gliders could cause a turn. At the time of the turn the pilot was passing on the hill side of two paragliders who were soaring north in front of the ridge. The Board could not rule out a wake turbulence encounter, but thought it highly unlikely given the relative positions – and in their experience such an event is easily controlled just like any other minor turbulence encounter.

On balance, given the points above and that the pilot had been airborne for five minutes or so, and had made gentle turns and course corrections without obvious difficulty, the Board though it unlikely that the initial turn was uncontrolled.

The Board then considered the likely reasons for a controlled turn. The Board considered the possibility that the pilot may have made a right turn towards the hill to avoid other gliders. Although there were a lot of other aircraft airborne, these were spread along the four miles of the ridge at various altitudes. Photos taken just before the accident show the hang glider progressing northward along the ridge: the only time other aircraft are anywhere in his proximity is when he passes on the ridge side of two paragliders just above the take off area. The photograph shows the hang glider already passing the two paragliders, on a straight course, well clear of them. The Board therefore discounted this possibility.

The Board considered that the most likely explanation for the initial turn was that pilot may have made the turn deliberately to position himself on a downwind leg for a right hand circuit approach to top land. (His watching travelling companion pilots were expecting him to top land and had positioned themselves to watch his approach.) This would be the sort of right-hand circuit approach that he would have used at the huge flat fields used by the tow school. It is not a safe approach to use when hill soaring and is never recommended: A normal turn to top land is to crab in at a shallow angle to the ridge from a point several hundred metres off to one side of the intended landing area. This ensures that the pilot is not flying downwind (where at low altitudes the high ground speed can confuse inexperienced pilots, leading to them slowing the glider and stalling). It also minimises the angle of turn required for a final turn, slows the whole approach sequence, and gives the pilot an easy option of abandoning the approach at any stage and returning to the ridge. All of these factors make the correct approach easier and safer for the pilot. The accident pilot had all of these factors against him. (As a tow trained pilot he would not have had the correct method of setting up a hill top landing approach taught to him.)

QUALIFICATION / SUPERVISION

The pilot had qualified as a Club Pilot (Tow). He was not trained or qualified to fly from hills.
As he had not completed the five hours or fifty launches post CP required, he was not experienced enough at flying his glider to enrol for the short 'Hill Conversion' course. Under BHPA rules, the correct route was for him to attend a hill school and complete a hill CP, under the close supervision of a licensed hill Instructor.

Various Coaches at the Long Mynd club had, on an ad-hoc basis, assisted the pilot and his glider co-owner when they had visited the Long Mynd in November and December 2004, and again on the day of the accident, but no clear coaching relationship had been established. In fact the Coaches 'assisting' on the accident day, despite having check flown the glider, assisted with launches and provided briefings and de-briefings, did not feel that they were 'coaching' the pilot and co-owner. The pilot and the co-owner knew that they were not qualified to fly from hills. None of the Coaches had identified this fact. (Because the pilot and co-owner had completed their early Elementary Pilot training at a hill school, and so were experienced at the different take off technique, they considered that they could manage to fly hills without formal conversion training.)
It was also apparent that the Coaches had the impression that the pilot was more experienced than he actually was.
It was the opinion of the Board that the ad-hoc hill 'conversion' situation allowed the situation to develop where several unfavourable factors came together at once, unchallenged.

EMERGENCY PARACHUTE

The pilot was not carrying an emergency parachute. The Board considered it unlikely that there would have been time and height to deploy an emergency parachute once control had been lost. However, emergency parachutes are traditionally fitted to the chest area of the harness, and there is circumstantial evidence to suggest that this 'padding' can provide some measure of protection in the type of chest impact which resulted in the death of this pilot.

SECTION 3 - CONCLUSIONS

The Board found that the cause of the incident was that the very inexperienced tow pilot with low currency lost control of the unfamiliar hang glider whilst engaged in activities he was neither trained nor qualified to perform.

SECTION 4 - SAFETY RECOMMENDATIONS

None