British Gliding Association Aircraft Accident Report: Ref 2019005

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Aircraft Type and Registration: Schempp-Hirth Flugzeugbau GMBH Duo Discus Turbo, G-CJUM, BGA 4792

No and Type of Engines: 1 x Solo Kleinmotoren GMBH 2350 D

Year of Manufacture: 2000 (Serial Number 5)

Date & Time of Accident: 13th October 2018, 1230 Local.

Location: Base of Beachy Head Cliffs

Type of Flight: Cliff Soaring Training **/** Instruction

Persons on Board: Crew – 2 Passengers - 0

Injuries: Crew 1 - Inhalation of Water and Mild Hypothermia. Crew 2 - None

Nature of Damage: Aircraft destroyed. Wreckage not Recovered.

Commander's Licence: BGA Gliding Certificate, FAI Diamond Badge, Full Rated Instructor

Commander's Age: 78

Commander's Flying Experience: 5,160 Hours and 5,755 Launches

Information Source: BGA Field Investigation

Synopsis

The purpose of the flight was for the second pilot to undergo soaring training on the cliffs at Beachy Head. After a prolonged period of both marginal and unsuccessful soaring the commander found himself in a position where all terrestrial landing options had been exhausted and was left but with no other option but to ditch in the English Channel.

A successful ditching was completed and the occupants exited the aircraft, but found themselves in significant difficulties due to strong tidal conditions and large rocks close to the shoreline. The commander suffered minor injuries due to inhalation of water and mild hypothermia. The second pilot was uninjured. Both pilots were rescued by a Coastguard Helicopter and taken to hospital but discharged later that day.

CAA Safety Sense Leaflet 21d, 'Ditching', provides advice on the correct type of life-jacket to wear and guidance and information on ditching.
Following this incident the commanders club has written a comprehensive guide to cliff soaring which includes detailed information on cold water survival in the case of ditching.

Both pilots involved in this incident were interviewed using the Critical Decision Methodology (CDM) of Cognitive Task Analysis (CTA) in an attempt to identify the critical cognitive factors that may have contributed to the accident. Separate interviews were conducted in order to establish the individuals' recollections of events, and explore cognitive "hot-spots" (decisions, changes in situation awareness) the process identified in more detail. The following is a synopsis of several hours of discussion.

History of the Flight

The aircraft was being flown by two Fully Rated Instructors, one of whom was undergoing training on soaring the cliffs at Beachy Head. The forecast for the day was for a Southerly wind (180°), a speed of 20 knots and clear skies; such conditions are deemed favourable for cliff soaring.

After a normal aerotow launch to approximately 4,000 feet the glider released just to the North of Brighton and immediately conducted a functionality check of its Solo 2350 engine. The glider was then flown in a South Easterly direction towards Newhaven following the coastline in order to take advantage of weak lift from low level cliffs.

On reaching Newhaven the pilots found themselves unable to successfully soar but continued on track towards Seaford Head and Birling Gap where they believed conditions to be better. Like Newhaven, the pilots found conditions at Seaford and Birling Gap to be poor and although there was some 'reduced sink' their overall height was now estimated to be 500 ft above mean sea level.

At Birling Gap the aircraft commander pointed out a potential landing option to the second pilot which could be used if conditions failed to improve. The commander knew the selected field to be suitable as he had previously used it before.

At this point the pilots received a radio call from another glider, which was also soaring the cliffs that suggested that soaring conditions at Beachy Head (approximately 3km from their current location) were good. Having received this new information the pilots briefly discussed their options and made a conscious decision to continue onwards towards Belle Tout lighthouse and then around the corner to Beachy Head.

Arriving abeam Belle Tout lighthouse the pilots found themselves in strong sink and too low to return to the previous selected field, or attempt an engine start. As a result a decision was made to ditch at the base of the cliffs, as close to the shore line as possible whilst avoiding large rocks.

The commander lowered the glider’s undercarriage and made a successful ditching.. The glider remained upright and afloat and was slowly drifted closer to the shoreline. The pilots remained on-board for a short time before removing their parachutes and entering the water to swim to the beach.

Both pilots found the swell to be significantly stronger than originally anticipated and struggled to get to the beach. The aircraft commander in particular found himself in difficulties but was assisted by the second pilot who had managed to get hold of a large rock. Both pilots eventually made it onto the beach and moved up the beach onto a recent rock fall to get away from the incoming tide.

The pilots waited on the beach for approximately an hour after which they were rescued by a helicopter from Her Majesty's Maritime and Coastguard Agency (HMGC). Both pilots were taken to hospital and the commander was treated for water inhalation and mild hypothermia but released later that day along with the second pilot.

Figure 1: G-CJUM and Both Occupants Shortly After Ditching

Aircraft Commander's Report

The preceding evening (12th October, 2018) the commander had been invited to fly with another pilot in some other two seat glider on the 13th October, however he declined as he required urgent repairs to his car. He also phoned a member of his own syndicate to inform him that he would not be using their glider but that he would be at the airfield close to midday. The syndicate member stated that he was due to be the duty instructor but that he may fly.

On arriving at the airfield after the vehicle repairs the commander found that his glider (G-CJUM) had been taken to the launch point and the second pilot was stood by the cockpit waiting to fly. The commander expressed concern over these actions but was told by the duty instructor that he himself was unable to fly due to other airfield related commitments and that the commander could take the second pilot on an cliff soaring instructional flight.

The commander once again expressed concern, as he had not had an opportunity to check the latest weather and also have some refreshment after what had been a stressful morning. He went on to suggest that the duty instructor fly in his place, however, the duty instructor declined. The commander described himself as feeling under pressure to fly, particularly as the second pilot was a senior club instructor, so he reluctantly agreed to conduct the flight.

On launching the commander described being unsure of the exact wind direction due to the lack of preparation time prior to the launch and not confident that the cliffs would be soarable. Once released from the aerotow he did consider that the wind might be sufficient due to the glider's ground speed and track across the ground, however, he remembers noting whilst heading towards Newhaven that the sink rate was

higher than would normally be expected so the lift in the Seaford and Birling Gap area might be poor.

At Birling Gap, and on sighting a landing field he had landed in previously the commander made a provisional decision to land, although he assessed that he was “too high to make a straight-in approach” from that position. Prior to starting his circuit he heard the radio call from another glider advising that the lift was better further to the East. Following a short discussion with the second pilot he changed his decision and elected to continue east as he believed the information passed over the radio to be accurate and he had no reason to believe the cliffs wouldn't be soarable. However, on continuing towards Belle Tout lighthouse and Beachy Head heavy sink was encountered and the commander quickly recognised that there was insufficient height to return to the previously identified safe landing area and that as no other options were available the glider would have to be ditched into the sea.

The commander described himself as feeling “uneasy” throughout the flight. He also intimated that he would not have conducted the flight were it not for the pressure he perceived had been placed upon him when he arrived at the airfield. He also stated that he felt convinced that had he been flying solo or with another syndicate member, he would have decided to return to the airfield from the Newhaven area where he first realised that conditions were not as expected. What is more, he described himself as feeling under pressure to proceed due to the senior status of the second pilot and the expectation that he would give him a good flight.

Figure 2: G-CJUM at the Base of the Cliffs with Beachy Head Lighthouse in the Background

Second Pilot's Report

The second pilot is a senior club member and instructor. He described how he had taken an interest in cliff soaring due to its rise in popularity exacerbated by a high profile in social media. He has a desire to learn about this particular type of soaring due to the fact a number of club members conduct it and he himself has little knowledge of the skills required and risks associated with it.

On the 13th October he describes how he was driving to the airfield, noticed the strong Southerly wind and wondered if it would be a good day for soaring on the cliffs. On arrival at the airfield he went to see the duty instructor who he knew to have experience in soaring the cliffs and enquired as to whether he felt that it would be a suitable day for a training flight in the duty instructor's glider (G-CJUM). The duty instructor (who is also one of the commander's syndicate partners) stated that it was the commander's turn to fly G-CJUM that day and that he would be along later. He also suggested they get the glider out and ready it for the commander's arrival.

Realising the commander was somewhat later to the club than originally anticipated the duty instructor agreed to fly with the second pilot; however, as they were getting the glider ready to launch the commander drove onto the airfield. The duty instructor went to talk to the commander and after some discussion a change of pilot was agreed.

As the second pilot had little experience in both the type (Duo Discus), and the engine system it was decided that the commander would fly from the front seat (he normally flies from the rear). He describes the launch as normal and also how after tow the engine was extended, started and then stopped and retracted without issue.

As he had little experience in cliff soaring the second pilot said that he was not alarmed by the initial lack of lift, however, he did state that he began to feel ill at ease when at Birling Gap. He asked the commander if they had enough height to cross the gap to which the answer from the commander was yes. When the commander showed him the potential landing field he described himself as feeling too far away but this could be put down to inexperience on type. He states that he suggested that they land in the field prior to the radio call from the second glider. On receiving the radio call from the second glider the second pilot confirms that a short discussion was had between himself and the commander regarding continuing to the East and that they both agreed to carry on.

As they proceeded the second pilot recalls the commander saying 'it's not looking good'. He asked the commander if they were going to land in the sea to which he replied 'yes'. He described the commander as calm and collective. He also commented on the quality of the landing describing it as near perfect.

Post landing the second pilot exited the glider into the water but then decided that as the glider was being drifted towards the shoreline by the swell, it was best to climb back onto it and wait until it was closer to the shore.

Once the glider was close to the shore he again exited the cockpit but struggled to get hold of the rocks. He was also concerned that the glider's wing may strike him as it was being thrown around by the waves. He got

himself onto a rock but saw the commander was struggling. After two failed attempts he finally managed to grab the commander's hand and help him onto the rocks. This undoubtedly saved the commander's life.

The second pilot considers the commander to be a highly experienced pilot who has a high level of expertise and knowledge regarding cliff soaring. He also regards him as a close friend, mentor and excellent instructor. He was very much of the opinion that the flight was instructional in nature and was clear that the commander was pilot-in-charge. He further states that the commander appeared keen to go flying and showed no sign of reluctance. At no point other than those listed did he question the commander's actions, nor did he attempt to take control.

Discussion

Accident reports frequently refer to what is commonly known as the "error chain", and the conclusions they draw focus on the opportunities that were missed by to avert the accident. This "hindsight bias" makes it easy to identify things a crew or individual could have done differently, however, it is important to remember that the individual(s) involved did not know the eventual outcome in advance - they simply responded to the world as they perceived it, and their decision-making was based upon their assessment of the situation at that moment.

Human Factors

No evidence has come to light that would indicate that at the time of the accident the glider was anything other than fully serviceable and as far as can be determined, neither mechanical failure or un-serviceability were contributing factors. There is also no evidence of malice, sabotage, or neglect on the part of any individual. However, several Human Factors and their associated vulnerabilities which almost certainly combined to influence the outcome can be identified and are worthy of further discussion. These are: Loss Aversion, Plan Continuation Bias, and Confirmation bias. The relevance of each will be discussed in turn.

Loss aversion

Loss aversion is related to prospect theory. In academic speak, Prospect Theory is the psychological concept which describes the way people choose between alternatives that involve significant risk and where the probabilities of the outcome remains uncertain. The theory states that individuals make their decisions based on the potential value of losses and gains rather than the final overall outcome. The loss aversion aspect of prospect theory refers to an individual's tendency to prefer avoiding losses to acquiring equivalent gain. It is therefore important to distinguish the differences between loss aversion and risk aversion, as loss aversion is the utility of a momentary pay-off depending on what has been previously experienced, or indeed, what is expected to happen where as risk aversion is the behaviour of those that when exposed to risk attempt to lower said risk to an acceptable level. In a nutshell, human beings tend to gamble, take on more risk and push a poor position when they are "down" e.g. trying to soar away in weak lift or trying to start the engine, when planning and executing a safe field landing should be the priority.

How might this be relevant? The commander is considered to be one of, if not the, most experienced and competent cliff soaring pilot at the Club. The flight was intended to be an instructional flight for the second pilot, who although a very senior member of the club was inexperienced in cliff soaring. "Loss" in this instance would be a poor demonstration and a field landing. The radio call from the other glider that was soaring the cliffs close by occurred at a critical decision point in the flight. The choice for the commander was

either an inconvenient field landing with perhaps some loss of face, or to press on to what he now believed would be better lift.

Plan Continuation Bias

The second contributing factor is that of plan continuation bias. Plan continuation bias theory describes our unconscious cognitive bias to continue with the original plan despite changing conditions. This bias is considered to be stronger towards the culmination of a task. Furthermore it is considered to have the effect of obscuring the more subtle cues. From a workload perspective, it is much less demanding cognitively to simply continue with the original plan than it is to have to come up with a revised one. Moreover, in physically and cognitively demanding situations when capacity is already stretched e.g. getting low and running out of options while soaring, a pilot's subconscious attention mechanism may not naturally be drawn to the cues that would indicate that the expected or assumed soaring conditions may have changed.

How might this be relevant? These are powerful but unconscious cognitive biases which lead the pilot towards continuing the original or a habitual course of action. There were many clues in the commander's recall of events that indicate the conditions were not working out as he had expected. He described himself as feeling "uneasy" throughout the flight and remembers noting whilst heading towards Newhaven early in the flight that the sink rate was higher than would normally be expected in good soaring conditions.

Confirmation Bias

Another common factor that is likely to have played a part is that of Confirmation bias. Confirmation bias occurs when cues and information are interpreted in a way that confirms a person's existing assessment of a situation while any that contradict it are selectively ignored. One of the most well known examples of this human vulnerability led to a fatal accident involving a British Midland B737 near Kegworth in Leicestershire while attempting to make an emergency landing in 1989. The flightcrew shutdown the lefthand engine in response to severe vibration and smoke on the flightdeck. They were new to this type of aircraft and believed that the flightdeck was ventilated by air from the lefthand engine. They shut that engine down despite receiving information that indicated smoke and flames had been seen coming from the righthand engine. When the damaged righthand engine failed there was insufficient height to restart the serviceable engine.

How might this be relevant? It isn't known for certain (neither the commander or second pilot could remember) if the radio call from the second glider reporting good soaring conditions further east which the crew received as they passed Birling Gap was in response to a request by them for information, or just a complete coincidence. Never the less, it definitely influenced the decision to continue, and would have confirmed the belief that better soaring conditions could be anticipated towards Beachy Head given the east/west orientation of the cliffs in that position and the southerly wind direction.

Conclusion

The investigators' conclusion is that the accident was non-technical in nature and primarily the result of "Human Error", as discussed above. What is commonly described as "peer pressure" may also have been a factor, as the commander believed that he had made his reticence to conduct the flight obvious and overt. However, his discomfort does not appear to have been obvious to those around him so it cannot be established with any certainty that it was truly a factor. Never the less, the fact that the commander had (or

was given) little time to prepare himself either mentally or physically for the flight would without doubt have been performance-diminishing from a “threat and error management” perspective.

It is also possible that factors less obvious and more systemic in nature (e.g. safety culture and supervision) played a part on the day and contributed to the accident. Additionally, although not medically qualified, the investigators felt that the aircraft commander was suffering and showed signs of the symptoms of significant post-traumatic stress disorder (PTSD) as a result of this incident. As a result of this observation a recommendation has been made to the British Gliding Accociation that it considers reviewing post-accident action guidance, to take into account the longer term impacts of a traumer upon an individual.

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