

AAIB Bulletin No: 6/95

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Aircraft Type and Registration: Hiller UH-12E4, G-BTJE

No & Type of Engines: 1 Allison 250-C20B turboshaft engine

Year of Manufacture: 1965

Date & Time (UTC): 15 March 1995 at about 1045 hrs

Location: Aber Falls, Gwynedd, North Wales

Type of Flight: Aerial Work

Persons on Board: Crew - 1 Passengers - None

Injuries: Crew - Serious Passengers - N/A

Nature of Damage: Helicopter destroyed

Commander's Licence: Commercial Pilot's Licence (Helicopters)

Commander's Age: 51 years

Commander's Flying Experience: 5,172 hours (of which 5,100 were on type)
Last 90 days - 7 hours
Last 28 days - 7 hours

Information Source: AAIB Field Investigation

History of the flight

The helicopter had been hired by the North Snowdonia Park Authority to transport bridge and pathway materials from the road-head access for the Aber Falls to the Falls themselves, a journey of about one mile. The gorge, in which both the road-head pick-up site and the Falls drop-off site are situated, is narrow at the Falls end and widens as it slopes gently downhill, so as to be one or two hundred metres wide at the pick-up site. One hundred metres downhill from the pick-up site, three sets of high tension cables are suspended across the gorge: The closest set to the pick-up point is of narrower gauge wire and is about 200 feet above the ground. The sites had been surveyed on foot by both the pilot and the helicopter operator and were considered by both to be the best available and suitable for the task ahead.

On the day of the accident, the pilot had already ferried several underslung loads and had spent some time at the drop-off site adjusting the position of a bridge. It was his custom to return to the pick-up point down what was for him the right side of the gorge, before turning left, parallel to the wires just below the pick-up site and left again to come to the hover above it whilst the new load was attached to the 20 foot wire strop. The general wind is reported as having been 270°/15 kt gusting 30 kt although, within the gorge, in most cases it was reported as light or calm.

The helicopter, returning to the pick-up point for the next lift, was carrying an underslung load of empty sacks and netting. It was last seen, by the several witnesses in the working party at the pick-up point, to be travelling in the normal manner along the side of the gorge and nothing unusual was noticed. The witnesses then looked down to prepare the next load and it was not until they heard two bangs and electrical crackling sounds that they again looked up and saw the helicopter passing sideways, right side first, through the nearest set of overhead cables. As it struck the wires with several parts of the airframe and rotors, the helicopter started to break up and fell, spiralling, into the wooded area beyond. There was no fire.

The helicopter ground party and the park wardens ran down the steep embankment to the aircraft wreckage, which lay beside a stream in the wood. The pilot was alive and conscious, but the various impacts had crushed the fuselage roof downwards and he lay prone, in his collapsed seat, beneath it. Realising the seriousness of the pilot's injuries, the party left the Senior Warden caring for the pilot and climbed back up to the track to call the Emergency Services and guide them to the site.

Within a quarter of an hour, an ambulance with paramedics, the Police helicopter and the Fire Service arrived on scene. The pilot was then freed from the wreckage, medically stabilised by the paramedics and transported by the helicopter to Bangor Hospital, arriving there at 1210 hrs. He is currently recovering from his injuries.

Engineering Examination

The helicopter had come to rest in an upright attitude on the east bank of the river. Impact forces had collapsed the left skid and virtually detached the tail boom whilst the engine and transmission had almost broken away to the left. The cockpit area, whilst basically intact, had been cut apart to release the pilot.

Parts of the machine were also found in a downwind trail between the electricity cables and main wreckage, including the tail rotor and gearbox, the horizontal stabilisers, a large quantity of canopy perspex fragments and a roughly 2-metre length of the large diameter inclined tail rotor drive shaft. A substantial piece of main rotor blade trailing edge and a piece of a tail rotor blade tip had been flung out about 200 metres to one side of the wreckage trail. It was clear from examination of this debris that the helicopter had been shaking and vibrating violently as it dropped roughly 200 feet from the cables to the ground. A dead Mallard duck was also found in the debris trail with one wing cleanly severed at its root. Subsequent examination by the Birdstrike Avoidance Team of the Central Scientific Laboratories strongly suggested that the injury suffered by the bird, albeit fatal, was not consistent with an impact sufficient to cause significant damage to the helicopter.

Clear evidence of heavy cable strikes was found on the right-hand rear skid cross-tube, the front right skid vertical tube and on the tail boom close to the horizontal stabiliser attachments. The main rotor blades had also 'wiped' across cables leaving characteristic striations on the underside of each. Scorch marks due to electrical arcing were evident on the tail skid. The middle pair of the 132 kV electricity cables had been severed by the helicopter.

Following removal of the wreckage to the AAIB at Farnborough, it was examined for any evidence of pre-cable impact malfunction. No such evidence was found; all damage was consistent with either impact with the cables or ground or due to the extreme vibration of the dynamic components between these two events. In view of the discovery of a dead bird in the wreckage trail, particular attention was paid to the tail rotor. Roughly two inches of the tip of one blade had detached early in the accident sequence and, although it did not prove possible to determine precisely what had caused this, the damage was not consistent with the relatively light injury suffered by the bird nor were any traces of bird remains found on the broken tip.

Additional information

Two further witnesses walking down the path from the Falls had watched the flight continuously as it flew from the Falls to the accident. They report that, whilst conducting a left turn towards the pick-up point, the helicopter's nose suddenly dipped and its tail struck the power cables. They also confirm that the helicopter then seemed to drift sideways towards the cables, before passing through them and spinning to the ground.

Although the pilot clearly recalls seeing three ducks flying towards the power cables, he is unable to remember at what point in this or in the earlier transits he saw them, or whether he had to take avoiding action to miss them. However, the otherwise unexplained sudden dip of the helicopter's nose may have been such an avoiding manoeuvre, which would have interrupted the turn, which had been conducted safely on all the previous transits, and may thus have caused the helicopter to strike the cables.