

Agusta 109 A MK II, D-HCKV

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Aircraft Type and Registration: Agusta 109 A MK II, D-HCKV

No & Type of Engines: 2 Allison 250-C20B turboshaft engines

Year of Manufacture: 1985

Date & Time (UTC): 2 January 2000 at 1330 hrs

Location: 1 nm south-west Newby Bridge, Cumbria

Type of Flight: Private

Persons on Board: Crew - 1 - Passengers - 5

Injuries: Crew - None - Passengers - None

Nature of Damage: Tail badly damaged, main rotor blades

Commander's Licence: Private Pilot's Licence

Commander's Age: 43 years

Commander's Flying Experience: 1,815 hours (of which 135 were on type)
Last 90 days - 15 hours
Last 28 days - 4 hours

Information Source: Aircraft Accident Report Form submitted by the pilot

The pilot was conducting a VFR flight from Blackpool to a hotel landing site at Newby Bridge, Cumbria. The hotel landing site was adjacent to a river approximately 1 nm inside the wide mouth of a valley with an elevation of 100 feet. The planned approach was over Morecambe Bay to the broad flood plain of the estuary towards the valley in which the hotel was located following the river upstream. The highest ground beyond the hotel was 1,000 feet.

The general weather situation was a high pressure system over the UK with a weak warm front over Blackpool. The weather at the destination was forecast as wind 240°/10 kt visibility 30 km and 3-6/8 cloud at 2,000 feet. On departure from Blackpool the weather was overcast at 1,500 feet with visibility of 15 km. The pilot flew at 1,000 feet over the sea on a northerly track with the weather improving as forecast.

As the pilot approached the estuary off Morecambe Bay, about 8 nm from his destination, he could see what appeared to be a small shower in the area of the destination. He descended to 800 feet maintaining 140 kt IAS since the forward visibility was still greater than 10 km. The pilot was listening out on the frequency of Cark Airfield and noted its position as he passed 3 to 4 nm west

abeam. Before turning east he could see that the visibility was going to deteriorate in the shower ahead and he descended further to 500 feet and reduced speed to 80 kt IAS with some 3 to 4 nm to run to his destination. The pilot's intention was to remain well below the cloud base. At 500 feet there was no sign of any cloud below the general cloud base of 1,500 feet. The pilot could see the whole of the flood plain ahead, which was virtually at sea level until it reached Morecambe Bay to the right. Whilst the visibility to the south was over 10 km, the pilot anticipated a reduction in the visibility to 4 to 5 km in what appeared to be a light shower. He intended to continue the flight to the east towards the mouth of the valley in order to see if there was sufficient visibility to enter the valley and reach the destination landing site.

The valley was orientated to the north-east and started just after a 45° left bend in the river. The pilot planned to fly on the left side of the river which gave him the best escape route if necessary permitting a wide right turn to the lower ground of the flood plane and the improved visibility in that area. Having informed his passengers of the possibility of returning to Blackpool if conditions worsened and receiving their agreement, the pilot felt under no pressure to continue the flight to the destination.

As the pilot turned east he flew into light drizzle which reduced the visibility to some 4 km. The general overcast and poor visibility produced a white 'goldfish bowl' condition with no horizon. At 500 feet on the radio altimeter, the pilot still had continuous sight of the ground and the river on his right leading to the valley mouth. There was also no sign of any cloud below the general cloud base. After a minute or so the visibility ahead quickly deteriorated to 2 to 3 km with no sign of improvement and so the pilot decided to abandon the flight.

He visually cleared the area to the right into which he intended to turn noting the low ground and improved weather conditions as expected. Recognising the potential for disorientation in the 'goldfish bowl' conditions he looked ahead whilst still level before slowly banking the helicopter into a right turn. The visual impression he had was the same directly ahead as in his one o'clock where he could see the river going towards the valley ahead.

During the right turn the pilot noticed that the white misty area ahead suddenly turned dark and then he saw trees about 50 yards away and level. He applied maximum torque and pitched the helicopter nose up but the aircraft struck the trees in a flared attitude. The impact caused severe damage to the main and tail rotor blades including the loss of both tail rotor blade tips. On three of the four main rotor blades part of the blade tips were lost. One main rotor blade spar was bent upwards, and a substantial part of the lower tail fin had been removed. The right side stabiliser was lost and there was damage to the fuselage.

As the helicopter emerged from the other side of the trees the pilot realised that he was in cloud with rising ground ahead. The helicopter was vibrating and shaking badly with very low forward speed. He maintained maximum torque and as little speed as possible in order to obtain the best climb gradient to avoid the terrain ahead. With a rate of climb of approximately 1,000 feet/min directional control was very difficult and the vibration was extreme. Realising the seriousness of the damage to the helicopter the pilot reassured his passengers and turned towards the estuary. At 800 feet radio altimeter he reduced torque and accelerated to 80 kt which made the helicopter much easier to handle. At 50% torque the vibration was manageable.

The helicopter quickly broke cloud and the pilot saw Cark Airfield about 4 nm away. The ground below was waterlogged precluding an immediate run on landing. A vertical landing would have required high torque which would have increased the stress on the already damaged blades and

aircraft structure. The pilot was also concerned about directional control at zero forward speed and elected to maintain the configuration of torque and speed, which he knew to be manageable. He approached the into wind runway at Cark Airfield, maintaining almost constant 30% torque, and touching down at 40 kt. The helicopter was shutdown and all occupants exited through the normal doors.

The pilot concluded that the top of the ridge which formed the north-west side of the valley was covered in hill fog which obscured the trees. The hill fog itself was obscured by the poor visibility and was impossible to distinguish in the white 'goldfish bowl' surroundings until it was encountered. The hill fog was on the windward slope along which the helicopter was being flown and was probably caused by a combination of very moist air and orographic uplifting. He considered that the accident was caused by his inadvertent entry into cloud at low level and his not being able to see the trees in time to take avoiding action.