

Aircraft Type and Registration: Aerospatiale AS350B Ecureuil, G-PLMA

No & Type of Engines: 1 Turbomeca Arriel 1B Gas Turbine Engine

Year of Manufacture: 1979

Date & Time (UTC): 5 May 1995 at 1915 hrs

Location: Near Lochgilphead, Strathclyde

Type of Flight: Aerial Work

Persons on Board: Crew - 1 Passengers - None

Injuries: Crew - Fatal Passengers - N/A

Nature of Damage: Aircraft Destroyed

Commander's Licence: Airline Transport Pilot's Licence (Helicopter and Gyroplanes)

Commander's Age: 52 years

Commander's Flying Experience: 8,800 hours (of which 380 hours were on type)
Last 90 days - 100 hours
Last 28 days - 90 hours

Information Source: AAIB Field Investigation

History of the Flight

The company was involved in the underslung transfer of fish within Scotland and the accident pilot had been recruited on a 2-monthly contract for April and May. He had flown intensively on underslung operations during April but had regular days off and had commenced a fresh sequence of tasking on 4 May. On that day he began a period of duty at Dalcross at 0555 hrs and came off duty at Salen, on the Island of Mull, at 1815 hrs; throughout the day he had been accompanied by his ground handler and they were accommodated at Salen for the night of 4 May. For 5 May, the company operations manager had arranged a relief pilot to take over some of the flying for a period during the day; this had been done following an increase in tasking and all the participants were briefed on the new company plan.

The pilot and his ground handler came on duty on 5 May at 0505 hrs and took off at 0535 hrs. Having completed the task involving movement of fish they landed at 1200 hrs. The relief pilot then continued with other tasks from 1245 hrs until 1630 hrs when he landed at Loch Glashen and met the first pilot

who had driven there in the relief pilot's car, arriving at 1400 hrs. As the two ground handlers prepared the equipment for refuelling the helicopter, the two pilots discussed the programme for the rest of the day. There were two further tasks to be completed, and the company plan was for the relief pilot to do the first, however, the pilots agreed between themselves that both tasks would be done by the original pilot.

The pilot started the penultimate task at approximately 1645 hrs and completed the first six lifts uneventfully. For the seventh lift, the pilot left Loch Glashen at 1955 hrs and was instructed by radio to unload the fish at an alternative site. Having completed this he then flew to Meal Mhor to drop an empty bucket, following which he landed and got out of the helicopter to talk to the lorry driver who was waiting with a load of fish for transfer. He informed the driver that he would return in 5 minutes and flew off with the unloaded sling and hook below the helicopter. Shortly after he departed, the helicopter was seen to turn to the right and then continue up Loch Fyne.

Various eye and ear witnesses were aware of the last moments of the helicopter's flight. Some reported that it seemed to be flying lower than they had seen before and some commented that the engine note changed just prior to impact. Additionally, all of those who saw it commented that the helicopter was rotating and that it was pitching up and down in the last moments of flight. At this late stage witnesses reported that they could not see anything hanging underneath G-PLMA. Two witnesses reported that one door appeared to be open and one young witness stated that she could see papers coming out of an open door.

Aircraft and Equipment Description

The aircraft has a three-bladed main rotor rotating clockwise, as viewed from above, driven by an engine and gearbox mounted on the cabin roof. Directional control is effected by a two-bladed tail rotor positioned on the right side of the tail boom, rotating anti-clockwise as viewed from the right. The tail rotor gearbox is bolted to mounting fittings in the top of the tail boom and is driven from the main gearbox by a segmented drive shaft. The tail boom carries a horizontal stabiliser on each side forward of the tail rotor disc and an upper and a lower vertical fin just aft of the tail rotor.

The pilot occupied the right-hand of two forward seats, each consisting of a glass fibre reinforced plastic (GRP) moulding with two steel attachment rails bolted to the base. His harness consisted of two lap straps, each terminating in a stitched loop shackled to a floor fitting at the side of the seat, and two shoulder straps anchored by an inertial reel bolted to the seat back.

The underslung load sling seen being carried by G-PLMA on its departure for the last flight was approximately 6 metres long and comprised a steel hook and a 5 kg steel ball weight carried on a 13 mm diameter steel cable, 4.6 metres long, which was attached via a swivel assembly to a 0.85 metre long woven nylon springer rope. The latter was shackled to a cargo hook carried beneath the belly of the helicopter and manually releasable by the pilot by means of a cyclic stick lever.

Crash Site

The helicopter crashed on the eastern shore of Loch Gilp (an inlet on the west coast of Loch Fyne), 2 nm from Lochgilphead. The ground in the area of the crash site sloped gently upwards towards the east but was somewhat uneven and rocky in parts. Crash site and wreckage examination indicated that the helicopter impacted the ground while rolled right, pitched nose down and yawing to the left, on an easterly heading, with a high descent rate and little forward speed. Initial ground contact was onto rocks, causing detachment of the right landing gear skid. The aircraft then rolled right, contacting the ground with the main rotor blades and the right horizontal stabiliser, before inverting and then coming to rest on its left side 7 metres from the initial ground impact point.

Portions of the helicopter were not located with the main wreckage, indicating that they had detached before the main part of the aircraft had struck the ground. The tail rotor gearbox cover, the aft 1.5 metres of the tail boom, including the vertical fins, electrical cables from within the tail boom, the tail rotor aft drive shaft and the window from the cabin right door were found 55-85 metres from the initial impact point on the beach of the Loch to the west of the main crash site between high and low tide levels. The tail rotor gearbox with tail rotor attached was found embedded in the ground 35 metres to the north of the initial impact point. The tip portion of one tail rotor blade had detached. The underslung load sling, a small fairing from the aft end of the tail boom and the detached portion of tail rotor blade were not recovered, in spite of extensive searching. The evidence from witnesses indicated that the sling and the missing portion of tail rotor blade probably fell into the Loch.

Wreckage Examination

The helicopter sustained severe damage, including detachment of most of the above-floor structure of the forward part of the cabin, partial separation of the remains of the tail boom from the fuselage and gross damage to the main rotor head. The cabin floor remained generally intact and the evidence did not suggest that major incursion into the cabin space had occurred either during or after impact. Severe fretting damage was apparent at the point where the main mounts for the tail rotor gearbox onto the tail boom had fractured, consistent with a period of operation with a gross tail rotor imbalance. Markings showed that both fins had been struck by the tail rotor blades, forcibly in the case of the lower fin, consistent with contact after the tail rotor gearbox mounts had failed.

The pilot's seat detached from the floor following fracture of the GRP moulding on one side and distortion of the attachment rail on the other. His harness remained fastened but the left lap strap released from its floor attachment as a result of failure of stitching in the webbing strap. The pilot remained in his seat, which came to rest outside the cabin, with the harness around him and attached to the seat by the shoulder strap inertial reel and to the helicopter floor by the right lap strap. The pilot was also retained by the electrical lead of his headset which remained plugged into a fixed socket mounted near the centre of the cabin floor; the headset was worn under a helmet with a chin strap and thus remained effectively attached to the pilot.

Post-Mortem Examination

The post-mortem examination revealed no evidence of any condition which may have contributed to the accident.

Formal Investigation

The Chief Inspector of Air Accidents has ordered a Formal Investigation into this accident to be carried out in accordance with The Civil Aviation (Investigation of Air Accidents) Regulations 1989.