

No: 1/93

Ref: EW/C92/9/3

Category: 2a

Aircraft Type and Registration: Aerospatiale SA365N Dauphin, G-BLEZ

No & Type of Engines: 2 Turbomeca Arriel 1C turboshaft engines

Year of Manufacture: 1984

Date & Time (UTC): 22 September 1992 at 1750 hrs

Location: Viking Bravo platform in the Southern Sector of the North Sea

Type of Flight: Public Transport (Charter)

Persons on Board: Crew - 2 Passengers - None

Injuries: Crew - Nil Passengers - N/A
Other - 1 (Fatal)

Nature of Damage: Minor to rotor blade tips

Commander's Licence: Airline Transport Pilot's Licence (Helicopters)

Commander's Age: 31 years

Commander's Flying Experience: 5,804 hours (of which 2,950 were on type)
Last 90 days - 147 hours
Last 28 days - 53 hours

Information Source: AAIB Field Investigation

History of the flight

The helicopter was engaged in a routine inter-rig task. The weather was marginal and earlier in the day, the task had been suspended due to poor visibility. By 1715 hrs however, the weather had improved sufficiently to allow a resumption of the task and at 1745 hrs the co-pilot landed G-BLEZ on Viking Bravo helideck. Viking Bravo is a fixed platform and therefore the attitude of the helideck is unaffected by sea motion. The wind on landing was 180°/10 kt with no turbulence and, after landing, the helicopter was centred on the helideck on a southerly heading. The autopilot was disengaged as required by the after landing checks. The helicopter was judged by the crew to be in a normal attitude and the rotor disk was placed in the 'normal' position as taught by the operator's training staff. As part of the investigation this 'normal' attitude was observed and revealed a minimum vertical clearance of about 10 feet 4 inches (3.24 metres) above the helideck directly in front of the helicopter. Thereafter neither pilot consciously touched either cyclic stick.

Having satisfied themselves that they were ready, the Helideck Landing Officer (HLO) was cleared by the commander to approach the aircraft and supervise the disembarkation of one of the four passengers on board. Access to the helideck was by a short staircase located on its southern side at the helicopter's twelve o'clock position and some five feet ahead of the edge of the rotor disc. The HLO approached the right side of the helicopter accompanied by a Helideck Assistant (HDA) who removed luggage from the hold while the HLO exchanged manifests with the commander. Having taken the luggage from the HDA, the HLO removed it from the helideck and returned to escort the one disembarking passenger from the helideck. The HDA opened the right hand passenger door and the HLO escorted the passenger from the helideck followed by the HDA.

Meanwhile, the commander had decided that he would need more fuel due to the possibility of a weather diversion on return to his operating base. He informed the HLO of his requirement for fuel, and, to comply with safety regulations, he instructed the three remaining passengers to leave the helicopter while refuelling was taking place. The HLO signalled to the HDA who was now at the base of the access steps, that the helicopter was to be refuelled. The HDA went to fetch the refuelling log and fuel sample jar that would be required during refuelling and the HLO went to the rear right door of the helicopter to supervise the disembarkation of the passengers. Two passengers, one of whom was 6 feet 2 inches tall, were escorted from the helideck via the south stairs without incident. As the third passenger was leaving the aircraft, the HDA was seen to mount the south stairs carrying a fuel sample bottle and approach the nose of the helicopter. At this moment, the co-pilot felt the helicopter jump as the main rotor struck the HDA on the head killing him instantly. The co-pilot immediately grabbed the controls, but he was unable to recall whether or not the cyclic control was displaced from the position in which he would have expected it to be.

The flying control system

Consideration of the operating principles of the flying control system indicated that movement of the cyclic control would always be accompanied by a corresponding movement of the main rotor disc. Calculations based on post-mortem examination of the deceased and the fact that only three of the four main rotor tips had been damaged, indicated that the rotor disc had moved from its normal position which gave a ground clearance of about 10 feet 4 inches (3.24 metres), to its lowest point above the deck of 5 feet 9 inches (1.8 metres), in about one second. This corresponded to 80% of available forward cyclic movement from its position with the rotor disc in its normal attitude, or a linear movement of eight centimetres at the stick top. Experiments were conducted to investigate the possibility of a system malfunction or inappropriate management of the autopilot/stick trim controls causing an uncommanded movement of the rotor disc. The results of these experiments indicated that, while uncommanded movement could be provoked with the autopilot engaged, the rate of movement

of the disc was an order slower than that calculated to have occurred in the accident. Subsequently it was reported that the stick trim release switch on the co-pilot's control column was sometimes sticking in the 'trim released' position. If this fault had occurred it could not have caused an uncommanded movement of the disc but it would have reduced the force required to move the cyclic control.

Cockpit Voice Recorder

A good quality replay was obtained from the area microphone and both pilot's hot microphones. The sounds of three main rotor blade strikes were clearly heard, but no other sounds were identified that were of any assistance in the investigation.

Engineering aspects

At the time of the accident, the helicopter was serviceable with no relevant deferred defects. In the accident, it had suffered damage to three of the four main rotor blade tip pockets. These were replaced with serviceable items and, after satisfactory completion of the relevant inspections followed by ground runs and an air test, it was flown to its shore base without incident. After further checks, the helicopter was returned to service and has since flown over 200 hours and 1,000 sectors without any relevant incident. The co-pilot's trim release switch was returned to the manufacturer for investigation and a condition report is awaited.

Safety aspects

At the time of the accident, neither pilot was guarding the flying controls nor were they looking outside the helicopter; the co-pilot was looking at some meteorological information and the commander was completing routine paperwork mounted on an A4 size clipboard held with its longer axis along his right thigh adjacent to the right hand cyclic control. The provisions of the helicopter operator's Operations Manual governing the operation of helicopters on helidecks did not specifically require either pilot to guard the flying controls nor were they required to maintain their full attention outside the aircraft.

The hazard associated with entering or leaving a helicopter under its rotor disk is well publicised in safety material and pre-flight briefings. Personnel working on helidecks are similarly briefed and trained. This accident occurred five months after another fatality that occurred on a ship's helideck when an S-76A helicopter moved backwards on the deck as a result of an exceptionally large wave which affected the whole ship (AAIB Bulletin 11/92). Although the circumstances of the two accidents are quite different it highlights the potentially dangerous environment of helidecks. Despite

this the incidence of personnel being injured by rotors is fortunately small given the scope and frequency of offshore helicopter operations.

The CAA, through a Working Group of the Helicopter Management Liaison Committee (HMLC), is currently examining, amongst other matters, cockpit procedures during helideck operations. A number of measures are under consideration to enhance the safety of personnel whilst in the vicinity of operating rotors; these include:

- a. a requirement for flying controls to be actively handled whenever the anti-collision beacon is OFF (ie personnel may approach or leave the helicopter);
- b. a restraint device to prevent inadvertent movement of the cyclic control;
- c. a cockpit indication of the height of the tip path plane together with improved conspicuity;
- d. improved training and better two way radio communications for helideck personnel;
- e. a limitation on the amount of paperwork required to be completed during helideck turn rounds.

Safety Recommendation

92-114 It is therefore recommended that the CAA, after consultation with all Class 7 licensed helicopter operators and other interested parties, promulgate guidelines and, where necessary, regulations for enhanced safety during rotors running helideck operations.