

No: 5/90

Ref: EW/C1140

Category: 2b

Aircraft Type and Registration: Sikorsky S 76A, G-BNSH

No & Type of Engines: 2 Allison 250 C 30 turboshaft engines

Year of Manufacture: 1980

Date and Time (UTC): 15 December 1989 at 2014 hrs

Location: 6 nm east of Humberside Airport

Type of Flight: Non-scheduled passenger

Persons on Board: Crew - 2 Passengers - 1

Injuries: Crew - Nil Passengers - None

Nature of Damage: Damage to main rotor blades and engine cowling, heat damage to engines and accessories.

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

Commander's Age: 41 years

Commander's Total Flying Experience: 10,500 hours (of which 380 were on type)

Information Source: AAIB Field Investigation

History of the flight

The helicopter left its base at North Denes, Great Yarmouth, at 1500 hrs for a number of destinations in the Ravenspurn Field. The outbound flight was uneventful. Shortly after take-off from the Trident 11 rig, a No 2 engine chip warning illuminated on the Central Warning Panel (CWP). In accordance with the emergency check list, the crew recycled the appropriate circuit breaker and the caption cleared, indicating a transitory condition. Just before landing on the West Kapper rig, the same sequence of events occurred and then, whilst completing turn-round procedures on-deck, the same warning caption illuminated and could not be reset by cycling the circuit breaker. The helicopter was closed down and a report made to company engineers at base. The helicopter was ground manoeuvred clear of the helideck to permit the landing of another S 76 carrying an engineer from the company base at Humberside. The engineer removed two small slivers of debris from the engine magnetic plug, topped up the engine oil and reported to the aircraft commander that the aircraft was serviceable. He then completed a turn-round inspection and signed the aircraft technical log. Both crew members inspected the helicopter as it was parked under two bright lights at the edge of the helideck. It was then pushed back onto the helideck and the landing gear and ADELTA pins were removed. After a normal start up, the helicopter then took-off.

It had been decided to return via Humberside where the engineer, who was the only passenger, and some other passenger baggage were to be off-loaded. The crew experienced some difficulty in synchronising the gyro compass and they noted abnormally poor radio transmitter performance. Some 20 minutes into the flight, and when approaching the reporting point LAGER which is 6 miles east of Humberside airport, the Master Caution flashed ON but nothing appeared on the CWP. The commander then sensed a slight deceleration, similar to that experienced when the landing gear is lowered. Shortly after this the crew detected an acrid smell in the cabin and, although they attributed this to the possible efflux of some chemical works over which they were flying, they consulted the emergency check list to deal with an electrical fire. With various services switched OFF the smoke appeared to diminish. A report was made to Humberside ATC who cleared the helicopter to land and alerted the Airport Fire Service to local stand-by. The helicopter landed at 2017 hrs and taxied to the parking stand, accompanied by fire appliances. Smoke was seen to be issuing from the engine cowling and a small fire was burning in the area of the Number 2 engine. This was extinguished using BCF. The Fire Service advised of the hazardous nature of burning Kevlar and the crew were later examined at hospital for any adverse effects but, apart from some slight smoke inhalation, they had suffered no ill-effects.

Engineering Investigation

The engineering examination showed that the engine cowling 'doghouse' fairing had been unlatched on the left hand side of the aircraft. The fairing had moved upwards and had caused the strut mechanism restraining the forward end to fail where it attached to the fairing on the left side. The fairing had then risen up sufficiently to contact the rotor blades, which had sustained slight damage.

The engine exhaust gases are normally ejected through the 'doghouse' fairing; when this moved the gases were able to circulate within the engine bay. This caused blistering of the paintwork and damage to electrical connectors and cables. In particular, the circuits for the engine N1 indications, bleed shut-off valve and heater shut-off valve were affected by the high temperatures.

Close examination of the latches on the left side of the fairing showed no damage or other indications that they had been engaged, although they were both 'closed'. On the forward latch, the additional 'Dzus' fastener which acts as a failsafe attachment, was disengaged and free of damage. There was some wear on the bar for the hook of the rear latch, and it is possible that this was engaged initially and slipped out due to vibration, but the distortion of the fairing prevented any check of alignment or adjustment being carried out. On another helicopter it was found possible on one latch to 'close' it and lay it almost flush with the skin, without either the hook or 'Dzus' fastener being properly engaged.