

Aircraft: Sikorsky S61N G-ASNL (Heavy helicopter - public transport)

Year of manufacture: 1963

Date and time (GMT) 11 March 1983 at 1452 hrs

Location: 77 nautical miles NE of Aberdeen

Type of flight: Charter

Persons on board: Crew - 2 Pasengers - 15

Injuries: Crew - Nil Passengers - Nil

Nature of damage: Aircraft sunk following successful evacuation

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

Commander's age: 37 years

Commander's total flying experience: 4435 hours (of which 4250 hours were on helicopters)

The aircraft was returning to Aberdeen from an oil platform 94 nautical miles to the North-East, at 1500 feet in good weather. Just as it reached the top of the climb there was a loud bang from the main gearbox, No 1 engine ran down, and the transmission oil pressure fell to 30 psi from its normal 50 psi. At the same time there was a loud high frequency vibration which did not disappear when the crew completed the necessary drills. Since the sea state was favourable the Commander, who had transmitted a 'Mayday' call as soon as the failure occurred, decided to alight on the sea, and successfully did so in a position 77 nautical miles North-East of Aberdeen. With flotation gear deployed the aircraft rode satisfactorily to its sea anchor, and the Commander decided to keep all personnel on board until rescue was at hand. Wishing to have a liferaft ready in case a sudden evacuation was needed, he instructed that the rear dinghy should be inflated but, shortly after the co-pilot had done so, a passenger reported that it had punctured. The co-pilot then deployed the front liferaft but in spite of his efforts it inverted during inflation and proved impossible to right from the aircraft door. Soon afterwards this liferaft also punctured and became completely unserviceable. Eventually a liferaft was lowered from an RAF Sea King helicopter and the survivors winched up without casualties. Some hours later the aircraft sank, but was eventually salvaged.

The preliminary investigation has shown that the large spur gear at the input to the freewheel unit in the No 1 drive train had broken up. A large segment of this gear had penetrated the gearbox casing, striking heavily one of the main rotor blade roots. Smaller fragments of debris had become enmeshed between the highspeed input pinion and the corresponding spur gear on the No 2 drive line, but this resulted in local damage which did not prevent the drive being taken up fully by the No 2 engine. The disconnection in the No 1 drive line and consequential overspeed of No 1 engine is believed to have been the reason for the No 1 engine shutting down.

Preliminary metallurgical examination of the failed gear had revealed evidence of fatigue zones within the primary fracture, which extended from the rim of the wheel inwards almost as far as the locating bolts at the hub.

The detailed technical investigation is continuing in an effort to define fully the failure mechanism.