No: 6/85 **Ref: EW/G85/01/02**

Aircraft type and registration:	Bell 206B Jet Ranger G-AVIG (light single engine helicopter)
Year of Manufacture:	1967
Date and time (GMT):	5 January 1985 at 1934 hrs
Location:	Weddell Sea 76°S 55°15W
Type of flight:	Construction Work
Persons on board:	Crew — 1 Passengers — None
Injuries:	Crew — 1 (minor) Passengers — None
Nature of damage:	Substantial
Commander's Licence:	Airline Transport Pilot's Licence (Helicopters)
Commander's Age:	45 years
Commander's total flying experience:	671 hours fixed wing and 7491 rotary wing (of which 28.4 hours were on type)
Information Source:	Aircraft Accident Report Form submitted by Flight Safety Officer.

The operation involved two Bell 206 helicopters which, over a period of a number of days, were to carry a total of 800 fuel drums underslung from a ship to a location six miles away on an ice shelf, where a depot was being established for future operations. The first part of the normal route towards the fuel depot was flown over pack ice until the 50 feet high edge of the ice shelf was reached. The final two miles were flown over the gently sloping ice shelf following a series of pointed wooden stakes to the depot which was approximately 100 feet AMSL. A direct route between ship and depot was also used occasionally, with the edge of the ice shelf occurring at about the midway point. This route across the ice shelf was not marked with stakes.

The start of flying on the first day of the operation was delayed for 1½ hours because of poor visibility, poor contrast and snow showers. Flying started at 0915 hrs and continued until 1225 hrs. The accident pilot was acting in a supervisory capacity initially but flew for the last hour of that period during which he reported that the visibility was 6 to 10 miles with reasonable contrast over the pack ice but poor to nil contrast over the ice shelf.

After a short break for lunch, flying continued in the afternoon. The pilot involved in the accident again participated in general supervision of the flight deck until 1500 hrs when he took over G-AVIG. Between 1600 hrs and 1645 hrs he estimated that the visibility had dropped to 6 to 8 miles and, although there was still a vague horizon, contrast was now poor over the pack ice and nil over the ice shelf. It was decided to cease flying after the next cycle of 3 lifts by each aircraft.

On the last flight the pilot carried a standard underslung load of two drums to the depot where he landed to pick up two load nets. The take-off for the return flight was normal and the pilot transitioned down the wooden route markers, climbing to 300 feet on the radio altimeter before turning 15° right to head directly for the ship, which was clearly visible. Torque was reduced to 70% and the aircraft established in the cruise at 500 feet AGL with a speed of 120 MPH. As the aircraft flew towards the ship it appeared to the pilot to float in space against the all white background, although a vague horizon was discernible. He called the ship and confirmed that this would be his final landing of the day.

The pilot had no recollection of losing his instrument scan, becoming distracted, seeing a radio altimeter warning or dealing with any malfunction before the aircraft flew into the snow. He remembered the cyclic being wrenched from his hand and the aircraft cartwheeling at high speed for at least two revolutions. When everything had stopped he vacated the wreckage and fired a smoke grenade which was lying on the snow nearby. He was soon picked up by the other helicopter and flown back to the ship.

Subsequent examination of the accident site showed a parallel skid trail for approximately 100 feet with the skid marks becoming slightly deeper and spreading progressively further apart. There was then a more pronounced impact mark indicating the "nosing in" of the fuselage and the start of the fuselage end for end rotation. Shortly afterwards the main rotor had struck the snow/ice heavily. The main rotor head and blades detached and also severed the tail section and part of the engine. Impact marks and various items of wreckage continued down the trail with the main fuselage coming to rest upright 217 feet from the start of the skid trail.

Various items of wreckage were recovered and further examination of these is continuing. Detailed examination of the combustion heater showed evidence of hot gas leakage between the plate supporting the fuel spray nozzle

and the area of the combustion can from which heated air is ducted into the cabin. During the medical examination of the pilot after the accident there were no obvious signs of carbon monoxide poisoning although specific tests were not made. The possibility of low grade carbon monoxide poisoning could therefore not be ruled out as a contributory factor.