No: 14/83 **Ref: EW/C 854/01**

Aircraft type and registration:	Cessna 310Q G-AZYI (light twin-engined fixed wing aircraft)	
Year of manufacture:	1971	
Date and time (GMT):	11 November 1983 at approximately 1948 hrs	
Location:	8 nm west of Dundee airport	
Type of flight:	not yet determined	
Persons on board:	Crew — 1	Passengers — 5
Injuries:	Crew — 1 (serious)	Passengers — 2 (fatal) and 3 (serious)
Nature of damage:	Aircraft destroyed	
Commander's Licence:	Senior Commercial Pilot's Licence (Instrument Rating expired)	
Commander's Age:	33 years	
Commander's total flying experience:	2300 hours (of which approximately 60 were on type)	

The flight had originally been planned from Gatwick to Aberdeen. Approximately one hour before take-off the destination was changed to Dundee because, due to industrial action by certain ATC personnel at Aberdeen, no aircraft could be accepted there without a previously booked landing time, and no booking was available for G-AZYI. The aircraft accordingly took off from Gatwick at 1743 hrs to fly to Dundee on an IFR flight plan via Ottringham and St Abbs. At 1924 hrs the pilot changed frequency from RAF Leuchars radar advisory service to Dundee and received the 1920 hrs Dundee weather observation, which gave a surface wind of 100°/6 knots, visibility 15 kms, 4/8 Sc at 1000 ft, 8/8 Sc at 2000 ft and QNH/QFE 1026 mbs. Shortly afterwards, the pilot reported to Dundee that he was having difficulty in receiving the Dundee NDB and asked for confirmation of the frequency.

At 1930 hrs, which was the pilot's notified estimate for Dundee, the approach controller at RAF Leuchars saw the aircraft on radar some 10 to 12 miles south-west of Dundee, tracking north-west. After co-ordination by telephone between the controllers at Dundee and RAF Leuchars, the aircraft was given a heading of 090°M to bring it overhead the Dundee beacon. The pilot then reported that he had a good ADF bearing on Dundee but was receiving no identification signal. At this time, the coding unit of the Dundee NDB was unserviceable, and a NOTAM was in force to this effect. At approximately 1938 hrs the pilot reported over the beacon and carried out a procedure turn in the overhead to establish the outbound track of 262°M. He reported OVERHEAD OUTBOUND at 1941 hrs. The Dundee controller expected to receive a BASE TURN COMPLETE call from the aircraft approximately 3½ minutes after the outbound call. When he did not receive this call, he waited for what he described as a reasonable interval and then called the aircraft to ask if the base turn was complete. The pilot replied that he was 'half-way round', and within one minute of this transmission, further reported BASE TURN COMPLETE. This last call was of low received signal strength, as if the aircraft was either at a considerable range or was shielded by high ground. The controller, thinking that the aircraft had possibly gone too far outbound, made a further call but received no reply. He then recorded the time, which was 1949 hrs. Unfortunately these times cannot be verified because the air traffic recording equipment at Dundee was out of service. It is noted that there is no formal requirement for ATC transmissions at Dundee to be recorded.

The pilot afterwards described how he saw a glow through the clouds from the lights of Dundee when close to the overhead. He then flew outbound for 2½ minutes at 120 mph, descending to the height on the approach plate (2240 ft) for the base turn. On completing the base turn he could not obtain a usable bearing from the ADF needle, which was hunting through ± 20°, but he could see ahead of the aircraft a line of lights which he thought were reflecting on water. He expected to be close to the Tay Estuary, and his impression of water reinforced this expectation. In fact, the inbound track on completion of the base turn lies approximately 6 nm north of the River Tay. He descended to 800 ft on the QFE to identify the lights, with the intention of then remaining in sight of the ground. After flying over the lights, he had no further visual contact and accordingly commenced a climb. Soon afterwards the aircraft struck high ground and caught fire.

The aircraft had crashed at 860 ft amsl on the north-west facing flank of a hill 8.3 nm west of the threshold of runway 10, almost directly beneath the extended centreline and some 200 metres from the impact point of a Partenavia P68B, which had struck the same hill on 8 September whilst carrying out an NDB approach to Dundee. AIB Bulletin 12/83 describes this earlier accident when, again, the air traffic recording equipment was out of service.

Examination of the Wreckage

Ground marks revealed that the aircraft had hit the hill obliquely whilst on a heading of 107°M, in a level pitch attitude and with approximately 18° of right bank. The right wing tip and right mainwheel had struck the ground almost simultaneously, followed by the right engine; the aircraft had then yawed violently to the right. The initial impact had been fairly flat and had been followed by two further impacts as the aircraft had continued along the slope and up the hill, coming to rest 60 metres from the point of initial impact. Propeller marks showed that both engines had been developing power at approximately symmetrical rpm, and that the aircraft's speed on impact had been between 98 and 109 knots. The cabin had been distorted during the impact sequence, causing all windows to either pop out or disintegrate. In addition, the cabin door had been forced out of its aperture. Fire appeared to have started after the aircraft had come to rest and to have burned fiercely for some time until the cabin was completely destroyed. Despite the fire damage, it was ascertained that both aircraft altimeters had been set on 1026 mbs; the flying control mechanisms were complete and had apparently been serviceable up to the time of impact.

Search, Rescue and Survival Aspects

At 2006 hrs, a rescue helicopter took off from RAF Leuchars to search for the aircraft but, by then, the cloudbase had lowered to 400 ft, the hills to the west of Dundee were covered in cloud, and the search could not be continued by helicopter. Mountain rescue searched throughout the night but were also hindered by hill fog and it was not until 0800 hrs the next day that the survivors were found by a search and rescue dog team.

The aircraft was fitted with shoulder restraint harnesses for the front seat occupants; the pilot and the front right rear seat passenger had only their lapstraps fastened and both had suffered head injuries, as well as severe injuries to their lower limbs. However they were able to drag themselves out of the aircraft through the door aperture. The passenger seated behind the pilot had not fastened his lap strap and had been thrown clear, probably on the second impact. The rear seat passenger has no recollection of how he escaped from the aircraft but recalls finding his clothes on fire. The remaining two passengers, on the right side, had been unable to escape from the aircraft.

Follow-Up Action

After the accident, the Dundee NDB and its associated fan marker were flight checked. Bearing information and radiated field strength from the NDB were found to be within correct tolerances and no spurious fan marker radiation was detected.

As a result of the two recent accidents in the same location, the CAA have been invited to review the instrument procedures at Dundee and to consider whether any changes or special warnings are necessary to improve safety.