INCIDENT

Aircraft Type and Registration:	Reims Cessna F182Q Skylane, G-GCYC
No & Type of Engines:	1 Continental Motors Corp O-470-U piston engine
Year of Manufacture:	1980
Date & Time (UTC):	7 March 2006 at 1820 hrs
Location:	16 miles north of Newcastle
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Minor damage to the fuselage
Commander's Licence:	Private Pilot's Licence with IMC and night ratings
Commander's Age:	68 years
Commander's Flying Experience:	865 hours (of which 13 were on type) Last 90 days - 40 hours Last 28 days - 5 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot, report of event provided by Newcastle ATC and AAIB enquiries

Synopsis

During a flight from Dundee to Manchester the aircraft engine lost power and ran roughly. An emergency landing in poor weather and gathering darkness was carried out at Eshott with the assistance of radar and with additional guidance from a flying instructor, observing from the ground at the final landing location, passed by telephone to the radar controller and relayed to the pilot.

History of the flight

The aircraft was flying from Dundee to Manchester. En route, communication was handed from RAF Leuchars to the Newcastle Approach frequency which provided a Flight Information Service. At the time, two radar positions at Newcastle, RAD 1 and RAD 2, were manned and a third radar controller, known as RAD 3 was operating telephones and handling communications. An Air Traffic Control Assistant (ATCA) was also on duty in the radar room and another in the tower.

Shortly after the handover, when the aircraft was approximately 19 miles south of St Abbs Head, flying at 4,000 ft, the engine began to lose power and run roughly. The pilot transmitted that he wished to divert to Newcastle, but subsequently announced that he would not be able to reach that location and asked if ATC knew of a suitable place to land.

The RAD 1 controller knew that Millfield, a small grass airfield, was only four miles from the aircraft position but, believing that the machine was flying between solid cloud layers, he considered that, in approaching dusk, the field would be difficult to locate and this diversion would also involve turning the aircraft towards high ground. He therefore decided that Eshott would be a more suitable alternative. The pilot agreed and the controller requested him to Squawk 7700 and provided vectors towards that location.

Eshott is a 'Prior Permission Required' (PPR) airfield with paved surfaces forming part of a larger, otherwise disused airfield, thus being a fairly distinct landmark. It has an air/ground radio service which is only manned at weekends.

During this period the aircraft was entering and leaving radar and radio cover. A Jetstream 41 aircraft flying from Newcastle to Aberdeen was used to assist two way communications. Whilst this was happening a radar ATCA and the RAD 3 controller plotted the aircraft's position on a 1:250,000 topographical chart to confirm high ground in the vicinity. The RAD 2 controller phoned the manager of Eshott who is also a flying instructor and fortuitously was near the airfield tending livestock and in possession of his mobile telephone. In addition RAD 2 took over all the radar traffic being handled up to that point by RAD 1.

An ATCA found a copy of Pooleys Flight Guide and thus obtained the relevant information for Eshott airfield whilst the RAD 3 controller phoned 202 Search and Rescue squadron at RAF Boulmer to alert them to the situation. The Distress and Diversion service were also informed.

When the aircraft was about 10 nm from Eshott the pilot informed Newcastle that he had identified the airfield on his GPS; the RAD 1 controller continued to supply vectors. RAD 3 phoned the airfield manager again to confirm the aircraft was inbound by which time the latter had parked his car beside the eastern end of Runway 08 facing in an approximately northerly direction. He was thus positioned to one side of the thresholds of the two parallel and adjoining asphalt and grass Runways 19. He informed the Newcastle controller of the vehicle's position and the need for the pilot to land with the vehicle on his right. He put on his headlamps and hazard warning lights. He also informed Newcastle that the cloud was overcast between 600 and 800 ft.

With the aircraft at about two miles from Eshott the airfield manager informed RAD 3 that it was in sight and proceeded to pass heading and level information to enable the aircraft to reach the strip. This information was passed to RAD 1 who in turn passed it to the pilot. The manager turned off his headlamps as the aircraft came nearer but left the hazard warning lights in operation. During the landing the aircraft struck a small barbed-wire fence, inflicting minor damage to the propeller, lower engine cowling, the undercarriage leg fairings and the tailplane. This did not, however, adversely affect the aircraft which otherwise landed successfully.

Aircraft examination

Subsequent examination of the aircraft at the airfield reportedly revealed low compression on one cylinder. The aircraft was then dismantled by its maintenance company and returned to its base at Manchester. There an auxiliary fuel tank was used to supply fuel to the carburettor equipped engine, enabling an extended engine running test to be carried out. This revealed no problem with the engine. The engineer involved concluded that carburettor icing probably accounted for the rough running and loss of power of the engine.

Meteorological information

An assessment of the aftercast specially provided by the Met Office to assist the investigation shows that a series of frontal systems was affecting the UK and moving east to north-east. The first, an active occlusion, lay along the east coast from Norfolk to the Firth of Forth and across to the Isle of Skye, moving north-eastwards at 15 kt at 1800 UTC. It was estimated that this front passed through the Newcastle area in the period 1500-1700 UTC. A second, less active, occlusion lay to the west and a moist south-south-easterly air mass affected the UK between frontal systems. Cloud of various types appears to have been present at all levels from 900 ft amsl to a minimum of 8,000 ft in the area south of St Abbs Head, that above 1,500 ft appearing to be 8/8ths cover. Conditions between Inverness and St Abbs Head do not appear to have been significantly better.

Most importantly, the conditions south of St Abbs Head included 95 to 100% humidity in all height bands below 5,000 ft, with a freezing level rising from approximately 3,500 ft at midday to 4,500 ft at 1800 UTC. The effects of this humidity level and the ambient temperature put the conditions at the aircraft's operating height well within the region where serious carburettor icing at cruise power can be expected in that class of engine.

This information, coupled with the satisfactory operation of the engine on the subsequent test, makes it reasonable to conclude that the rough running and loss of engine power resulted from a progressive build-up of ice in the carburettor throat. With the challenging flight conditions, the pilot may have been distracted from the need for frequent use of carburettor heat control in the high humidity conditions, leading to increasingly rough engine running.