ACCIDENT

Aircraft Type and Registration:	Cessna 152, G-IRAN
No & Type of Engines:	1 Lycoming O-235-L2C piston engine
Category:	1.3
Year of Manufacture:	1980
Date & Time (UTC):	3 July 2005 at 1510 hrs
Location:	Pleshey, Essex
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Extensive damage to nose leg, engine frame, propeller, fin, left tailplane
Commander's Licence:	Private Pilot's Licence
Commander's Age:	66 years
Commander's Flying Experience:	331 hours (of which 91 were on type) Last 90 days - 3 hours Last 28 days - 0 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

History of flight

The pilot was on a local flight from Andrewsfield Airfield, Essex. About 30 minutes into the flight the pilot reported that, whilst returning to Andrewsfield and shortly after descending from 2,500 ft to 1,500 ft, the engine abruptly lost power. The pilot selected the carburettor heat ON, checked the mixture was rich and that the magnetos were selected to BOTH. He then attempted to restart the engine but to no avail.

The pilot, realising that he was now at a low height, concentrated on flying the aircraft for a forced landing into a field. The field contained standing wheat which was about two feet high. Before touchdown the pilot held the aircraft just above the crops in an attempt to land at the correct speed and to reduce the subsequent ground run. However, the main wheels became entangled in the crops, the nose wheel dropped and dug into the ground. The aircraft then flipped over and came to rest inverted, suffering extensive damage to the nose leg, engine frame, propeller, fin and left tail plane. The pilot vacated the aircraft through one of the doors having suffered no injuries. The local emergency services were quickly on the scene and offered their assistance.

The pilot reported that he had used the carburettor heat at least once on this flight prior to the engine stopping and believed that the most likely cause of the engine stopping was an ignition problem.

Weather

The Meteorological Office provided an aftercast for the area at the time of the accident. It indicated that a slack, moist, west-south-westerly airflow covered the area with a cold front becoming slow moving over south-east England. Specific conditions were as shown in Table 1.

The visibility was expected to be 15 to 30 km, with mainly broken strato-cumulus clouds at 2,500 to 3,000 ft.

The pilot reported that the weather, he had obtained from Andrewsfield, indicated the surface wind as 280°/5 kt, visibility 24 km, broken cloud at 2,800 ft, temperature 17.6°C and humidity 78%.

Engine examination

The aircraft and its engine were inspected at the crash site by the maintenance organisation that usually serviced the aircraft. At the time of the inspection the carburettor heat control was fully in thus providing no heating to the carburettor, the throttle was at idle and the mixture was fully rich. The engine showed no signs of any leakage, the oil level was within limits and there were no signs of damage to any ignition components or control cables.

The engine was subsequently sent to an independent maintenance organisation for further tests. It was reported that the engine started without difficulty, had no defects and the engine produced power to within 5% of maximum, which are within the limits set by the testing organisation.

Icing

The aftercast temperature and dew point, for the time of the accident, were plotted on the Carb Icing Chart in Safety Sense 14, found in LASORS and AIC 145/1997. They fall, at best, in the *Moderate icing - cruise power/ Serious icing - descent power* area, and at worst, in the *Serious icing - any power* area.

An extract of LASORS Safety Sense 14, *Piston Engine Icing* is shown below:

> *Carb icing is not restricted to cold weather, and will occur on warm days if the humidity is high, especially at low power settings. Flight tests have produced serious icing at descent power with the ambient (not surface) temperature over 25°C, even with relative humidity as low as 30%. At cruise*

Height (agl)	Wind velocity	Temperature	Dew Point	Relative Humidity
Surface	250°/5 kt	+ 17·3°C	+ 14·9°C	86%.
1,000 feet	250°/5 to 10 kt	+ 14.4°C	+ 10.4°C	77%
2,000 feet	250°/10 to 15 kt	+ 11.2°C	+ 8.9°C	86%.

Table 1

Specific weather conditions

power, icing occurred at 20°C when the humidity was 60% or more. (Cold, clear winter days are less of a hazard than humid summer days because cold air holds less moisture than warm air.) In the United Kingdom and Europe where high humidity is common, pilots must be constantly on the alert for the possibility of carb icing and take corrective action before an irretrievable situation arises.

Conclusion

The ambient meteorological conditions and the flight profile preceding the engine failure, together with the absence of any defect with the engine, suggest that carburettor icing was the most likely cause of the engine failure.