ACCIDENT

Aircraft Type and Registration:	Jabiru UL-450 Jabiru, G-CEKM
No & Type of Engines:	1 Jabiru Aircraft PTY 2200A piston engine
Year of Manufacture:	2007
Date & Time (UTC):	29 March 2009 at 1600 hrs
Location:	Close to Headon, near Retford, Nottinghamshire
Type of Flight:	Private
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Substantial damage
Commander's Licence:	National Private Pilot's Licence
Commander's Age:	46 years
Commander's Flying Experience:	255 hours (of which 82 were on type) Last 90 days - 12 hours Last 28 days - 7 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The aircraft suffered an engine failure during a long final approach, due to suspected carburettor icing. The proximity of an operational power station and a broken electrical lead for the electric carburettor heat were considered to be significant factors.

History of the flight

The aircraft was being flown from Cromer to Headon. The pilot made a long final approach from 3 nm east of Headon. He commenced the descent from 1,500 ft QFE with the engine speed set at approximately 2,000 rpm. Both heater elements of the electric carburettor heat were selected on for the entire flight, and the pilot had selected the 'hot air' carburettor heat to ON for approximately 10 seconds at the start of the descent. During the descent the aircraft passed within 300 to 400 metres of an operational power station, located south-east of Headon, near the river Trent.

At approximately 300 ft QFE, the pilot increased the throttle setting, but the engine failed to respond. He selected the 'hot air' carburettor heat to ON and shortly thereafter, the engine stopped. The aircraft touched down short of the intended field and struck a hedge bordering the field. The nosewheel then entered a ditch, causing the aircraft to pitch over inverted. The pilot shut down the aircraft and switched the fuel off. Both he and the passenger were uninjured and exited the aircraft after kicking out the passenger window.

Atmospheric conditions – carburettor icing

The aftercast supplied by the Met Office is included in Table 1.

From the chart in Figure 1 it can be seen that the general conditions were favourable for 'light icing - cruise or descent power'.

As reported in AAIB Bulletin 4/2003, in which a Jabiru UL-450 G-TYKE suffered a loss of power after being flown close to a power station, the humidity of the air can be significantly raised over a considerable distance (possibly some miles) from cooling towers, depending on the wind speed and level of turbulence. This can create local conditions more favourable for serious carburettor icing.

Aircraft examination

The pilot inspected the aircraft and found no anomalies with the fuel system. However a wire to the electric carburettor heat system was found to be broken, rendering it inoperative. He considered that it was unlikely to have broken in the forced landing. He concluded that the electrical carburettor heat was probably not working during the latter stages, and possibly all, of the accident flight.

Piston engine icing

The CAA's Safety Sense Leaflet 14 General Aviation '*Piston Engine Icing*' (see LASORS published by the Stationary Office or www.caa.co.uk/safetysense) provides much useful information regarding engine icing. In section 7 'Pilot Procedures' sub-section j it states:

> *'Descent and Approach*
>
> *Carb icing is much more likely at reduced power, so select carb heat before, rather than after, power is reduced for the descent, and especially for practice forced landing or a helicopter autorotation, i.e. before the exhaust start to cool. (A full carb heat check just before selecting hot air for the descent is advisable). Maintain FULL heat during long periods of flight with reduced power settings. At intervals of about 500ft, or more frequently if conditions require, increase power to cruise setting to warm the engine and to provide sufficient heat to melt any ice.'*

Discussion

The most likely reason for the engine failure was carburettor icing. The failure of the electrical lead to

Height AGL	Wind Direction & Speed	Temperature (Celsius)	Dew Point (Celsius)	Humidity (%)
Surface	210°-220° 02-05	8.3	-6.3	35
500 ft	220° 06 kt	5.4	-6.8	41
1000 ft	230° 08 kt	3.9	-7.0	45
1500 ft	240° 10 kt	2.4	-7.3	49
2000 ft	240° 10 kt	0.9	-7.6	53

Table 1

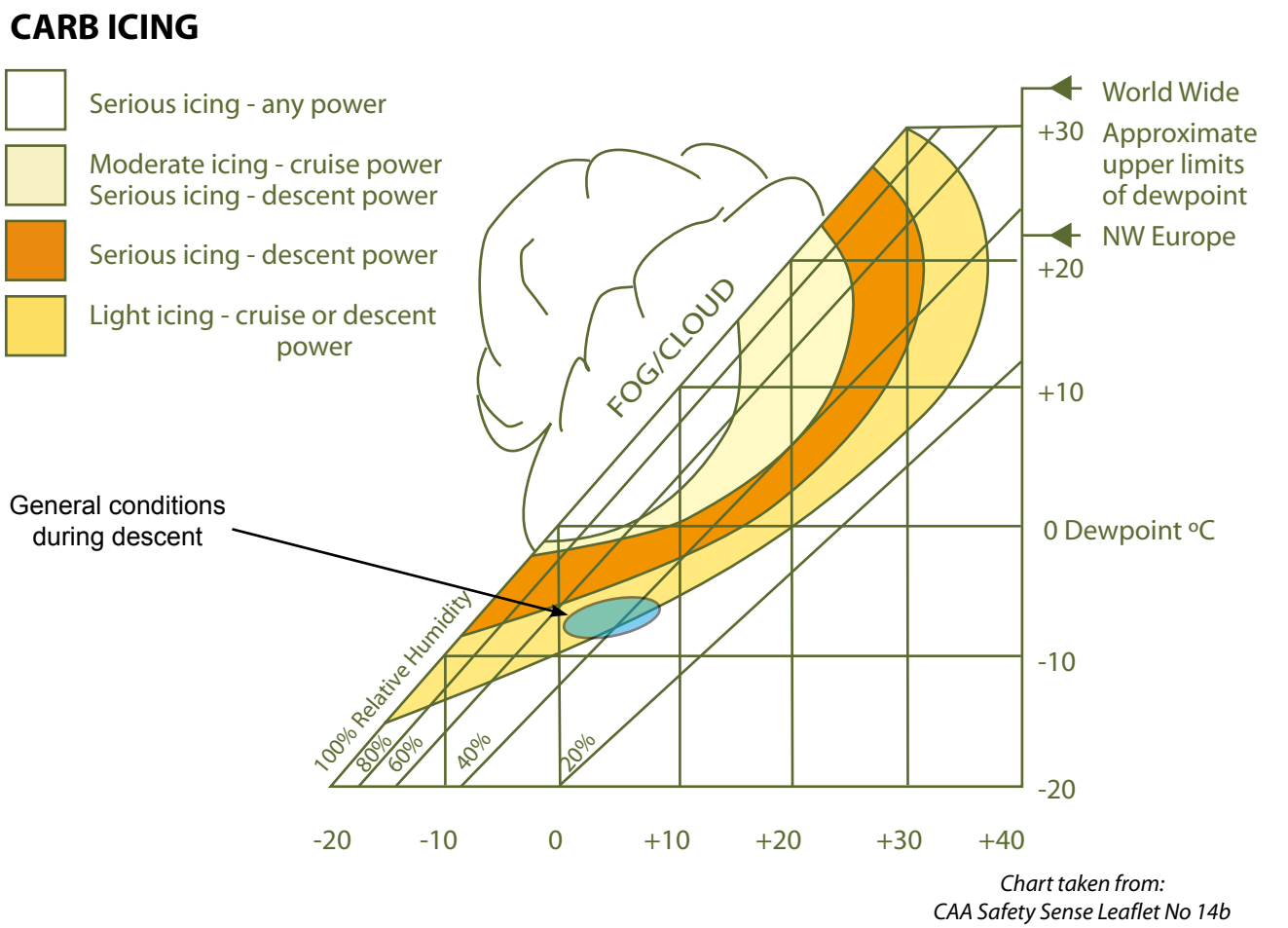

Figure 1

the electric carburettor heat and the proximity of the power station were considered to be significant factors. The pilot routinely flew with the electrical heat on at all times. If it had failed, his brief use of the 'hot air' carburettor heat may not have been effective in preventing carburettor icing.