Air Accident Investigation Unit Ireland

FACTUAL REPORT

INCIDENT

Raj Hamsa X-Air Mk. 2 Falcon, EI-DBI
Kiltyclough, Co. Galway
28 February 2016

An Roinn Iompair Turasóireachta agus Spóirt
Department of Transport, Tourism and Sport

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13[1] to the Convention on International Civil Aviation, Regulation (EU) No 996/2010[2] and Statutory Instrument No. 460 of 2009[3], safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

[1] **Annex 13**: International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.
[2] **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.
[3] **Statutory Instrument (SI) No. 460 of 2009**: Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.

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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI 460 of 2009, the Chief Inspector of Air Accidents on 28 February 2016, appointed Mr Leo Murray as the Investigator-in-Charge to carry out an Investigation into this Incident and prepare a Report.

Aircraft Type and Registration:	Raj Hamsa X-Air Mk.2 Falcon, EI-DBI	
No. and Type of Engines:	1 x Jabiru 2200	
Aircraft Serial Number:	671	
Year of Manufacture:	2002	
Date and Time (UTC)[4]:	28 February 2016 @16.30 hrs	
Location:	Kiltyclough, Co. Galway	
Type of Operation:	Private	
Persons on Board:	Pilot - 1	Passengers - Nil
Injuries:	Pilot - Nil	Passengers - Nil
Nature of Damage:	Minor	
Commander's Licence:	Private Pilot Licence (Microlights) Issued by the Irish Aviation Authority (IAA)	
Commander's Details:	Male, aged 43 years	
Commander's Flying Experience:	105 hours, of which 22 were on type	
Notification Source:	Pilot	
Information Source:	AAIU Investigation. AAIU Report Form submitted by the Pilot	

[4] **UTC**: Coordinated Universal Time. All timings in this report are UTC; equivalent to local time.

SYNOPSIS

The Pilot who was the sole occupant of the aircraft, was engaged on a local circuit training detail at Lurgan More Airfield, Co. Galway. Following a full stop landing, the Pilot completed the take-off checks and took off again from Runway (RWY) 22. At approximately 350-400 feet after take-off the engine '*spluttered for a couple of seconds*' and then '*cut out*'. The Pilot carried out a forced landing in a grass field with the aircraft incurring minor damage. There were no injuries. The Pilot contacted the AAIU by phone following the occurrence.

1. FACTUAL INFORMATION

1.1 History of the Flight

The Pilot subsequently submitted a report to the AAIU regarding the occurrence. In the report, he outlined that he had already been flying earlier on that day. It was also his first day flying since 1 November 2015, so he had decided to do some circuit work. He completed a total of 1 hour and 30 minutes in two flights and then landed for a few minutes. After completion of the take-off checks, the aircraft departed from RWY 22. At approximately 350-400 ft during the climb the engine '*spluttered for a couple of seconds*' and then '*cut-out*'. The Pilot noted that the fields below were sectioned off with electric fences. In his report, the Pilot said that by avoiding the fences he had little opportunity to flare adequately. The Pilot stated that '*his only fear was catching a fence and getting flipped upside down*'. The harder than normal landing resulted in minor damage to the aircraft.

1.2 Meteorological Conditions

A synoptic weather report for the time of the event showed a light south-easterly wind, 'few[5]' clouds at 2,200 ft, a temperature of 6 °C, dewpoint of 1.5 °C and a pressure of 1025 hPa (hectoPascals).

1.3 Induction System Icing

Engines fitted with carburettors are susceptible to ice forming in the carburettor intake venturi and throttle valve and such icing may occur at any time particularly in humid conditions. Such icing may degrade the proper functioning of the carburettor and can result in engine stoppage. EGAST[6] Leaflet GA 5 'Piston Engine Icing' provides pilots with guidance and information on the threat of induction system icing. Carburettor icing is the most common type, which will usually form before fuel icing and impact icing. Carburettor icing forms when there is a sudden temperature drop as fuel vaporises in the air and a second temperature drop when pressure reduces as the fuel/air mixture passes through the carburettor venture and throttle valve.

Because of its volatility and water content, carburettor icing is more likely to be experienced when Mogas (Motor Gasoline, typically Unleaded 95 RON) is used.

[5] **Few**: 1/8 to 2/8 of total cloud cover.
[6] **EGAST**: European General Aviation Safety Team.

EGAST Leaflet GA 5 also provides an indicative chart to highlight the severity of the carburettor icing risk, based on ambient temperature and dewpoint, for Avgas (Aviation Gasoline, typically 100/130 grade). In **Figure No. 1** the Investigation has plotted the conditions that pertained at the time of the event; this clearly shows that even using Avgas there was a serious icing risk at any power.

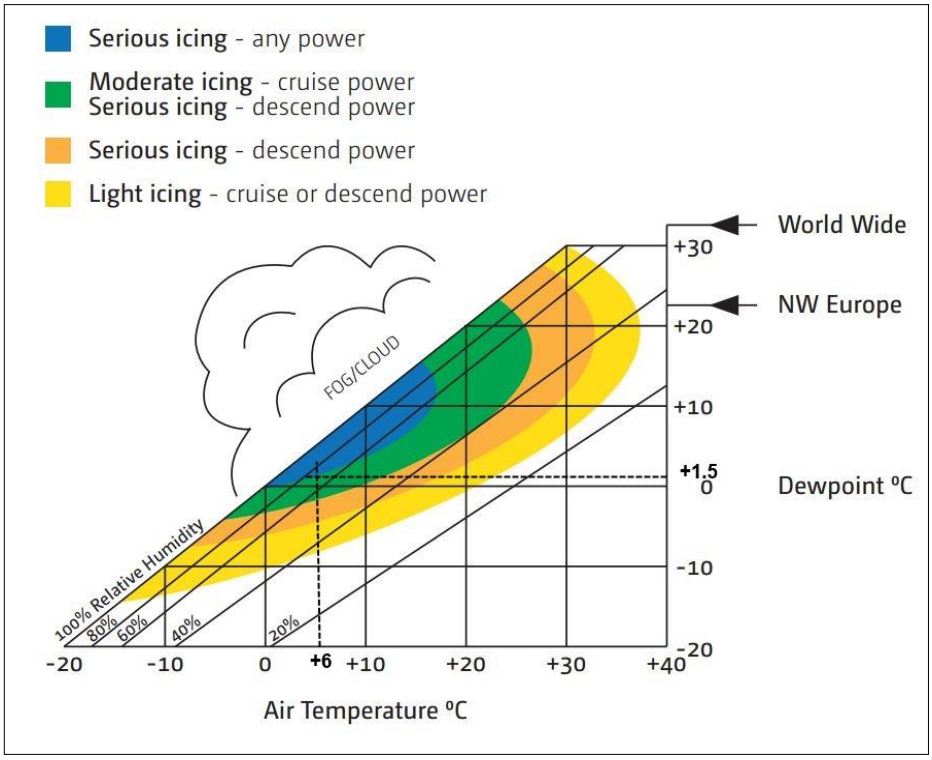

Figure No. 1: Risk of Induction Icing – Temperature v Dewpoint (*EGAST*)

1.4 Aircraft Description

The Raj Hamsa X-Air is a two-seat ultralight aircraft with a high wing and tricycle undercarriage. EI-DBI was powered by a 60 kW (80 hp) Jabiru 2200 air-cooled four-stroke piston engine driving a two-bladed Newton wooden propeller. The engine is normally aspirated by a BING constant depression Type 94/40 carburettor. The recommended fuel is Avgas 100/130, however Mogas with a RON[7] of 95 or above may be used. The engine was run on Unleaded 95.

1.5 Aircraft Damage

The Pilot recovered the aircraft from the site and informed the AAIU of the condition of the engine. The Pilot stated that it was possible to turn over the engine by means of the propeller and that there was no indication of mechanical damage.

The Pilot reported that the left main gear stub axle had fractured (**Photo No. 1**) and the side of the fuselage pod had some crush damage (**Photo No. 2**). He took a number of photographs which he forwarded to the AAIU along with an AAIU Report Form.

[7] **RON**: Research Octane Number.

Photo No. 1: Fractured stub axle

Photo No. 2: Pod crush damage (*Pilot photos*)

In his assessment of the incident the Pilot stated that: '*I have looked at the engine and can find no apparent or obvious damage. I have removed the prop and have restarted the engine*'. The engine was started using the fuel that was present in the fuel tank at the time of the occurrence. The Pilot stated that carburettor icing may have been the cause of the engine stoppage. The Pilot indicated that the aircraft would be repaired and properly inspected before further flight was undertaken.

2.0 AAIU Comment

2.1 Forced Landings

The nature of approach and climb-out areas adjacent to private and licenced airfields may not be conducive to conducting safe forced landings. Small fields, uneven or sloping terrain, rivers, ditches, stone walls, wooded areas, electric fences and overhead wires may make selection of a suitable forced landing area difficult. An engine failure or stoppage during the early stages of climb-out may leave an aircraft at a relatively low height and at a low airspeed with little time for a pilot to assess options. A turn-back to the departure runway is not recommended and can lead to rapid loss of airspeed and/or height and an increased risk of a stall/spin occurring.

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2.2 Incident

In this instance, the Pilot carried out a successful forced landing in the selected area. He recognised the presence of electric fences running across the fields and managed to avoid striking them during landing. The firm landing resulted in some minor damage to the aircraft which, considering the unexpected nature of the stoppage, could have had more serious consequences.

2.3 Risk of icing

According to EGAST Leaflet GA 5, an air temperature of 6 °C and a dew point of 1.5 °C (the prevailing conditions on the day) lies in the *'serious icing at any power'* range. Use of Unleaded 95 RON or Mogas would increase the likelihood of carburettor icing.

This Investigation does not sustain any Safety Recommendations.

- END -

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.

Produced by the Air Accident Investigation Unit

AAIU Reports are available on the Unit website at www.aaiu.ie

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