Ikarus C42 FB80 Bravo, **G-CICF**	**Headcorn Aerodrome, Kent**	**08 December 2022**	**Serious Incident**

Investigation Synopsis

The aircraft's lithium-ion main battery caught fire shortly after takeoff, creating significant quantities of smoke and hazardous gases within the aircraft cabin that affected the ability of the pilot to safely control the aircraft. A passenger, sitting in the right seat, was able to open the cabin door in-flight, which reduced the level of smoke in the cabin and the aircraft landed safely.

The investigation did not identify the cause of the battery fire. The location of the battery within the aircraft's cabin exposed the occupants to significant hazards when the battery caught fire, as the battery box did not contain the combustion products or heat from the fire. A similar airborne battery fire to the same aircraft type and lithium-ion battery type was found to have occurred in Germany, resulting in destruction of the aircraft.

One Safety Recommendation is made relating to reviewing the installation requirements of lithium-ion main batteries in cabin areas of Non-Part 21 aircraft, to minimise the effect to aircraft occupants following a battery fire.

Safety Recommendation 2024-006

Justification

The aircraft's lithium-ion main battery caught fire shortly after takeoff, creating significant quantities of smoke and hazardous gases within the aircraft cabin that affected the ability of the pilot to safely control the aircraft. The location of the battery within the aircraft's cabin exposed the occupants to significant hazards when the battery caught fire, as the battery box did not contain the combustion products or heat from the fire. A similar airborne battery fire to the same aircraft type and lithium-ion battery type was found to have occurred in Germany, resulting in destruction of the aircraft.

Therefore, the following safety recommendation was made:

> **Safety Recommendation 2024-006**
>
> It is recommended that the Civil Aviation Authority amends the design and installation requirements for lithium-ion main batteries that are located in the cabin areas of Non-Part 21 aircraft, to minimise the hazard to aircraft occupants following a thermal runaway.

Date Safety Recommendation made: 16 February 2024

LATEST RESPONSE

Response received: 31 October 2024

The CAA has completed an initial review of the Part 21 and non-Part 21 design and installation requirements for lithium-ion main batteries located in cabin areas of general aviation (GA) aircraft.

The initial airworthiness requirements contained in BCAR Section S, CS-VLA, CS-LSA, CS-22, and CS-23 were considered as part of this review. We found that each design code includes requirements to protect occupants from hazardous quantities of explosive or toxic gas emitted by batteries, both in normal operation and following probable malfunctions. Part 21 aircraft fitted with lithium battery installations are held to a higher safety standard and are required to comply with the additional requirements in SC-ELA.2015-01 as well as the requirements in the relevant Certification Specification. The CAA therefore considers Part 21 aircraft to be adequately protected from the risk of a lithium battery fire at this time. However,
The CAA recognises that non-Part 21 aircraft fitted with a lithium main battery are at increased risk in this regard and we endeavour to address this.

The CAA will work with the Light Aircraft Association (LAA) and British Microlight Aircraft Association (BMAA) to review and, where necessary, amend their existing standard modifications for fitment of lithium main batteries in place of standard lead-acid batteries to ensure the installations comply with the relevant design and installation requirements.

The CAA will also be reminding organisations holding an A8-1 approval of their responsibility to promulgate safety information (e.g. service bulletins) issued by the aircraft manufacturer to ensure that critical safety information is provided to operators in a timely manner.

The CAA will provide an update on the actions taken to address this safety recommendation by April 30th 2025.

Safety Recommendation Status **Open**

AAIB Assessment **Partially Adequate**

Action Status **Planned Action Ongoing Update Due** 30 April 2025

Feedback rationale

The AAIB acknowledges the CAA's initial response and looks forward to a further update by 30 April 2025 on the actions taken to address this Safety Recommendation. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

Response received: 24 April 2024

The CAA accepts this Safety Recommendation.

The CAA will assess and, where appropriate, amend the design and installation requirements for lithium-ion main batteries located in cabin areas of general aviation (GA) aircraft with a view to minimising the hazard they pose to aircraft occupants. Although the safety recommendation scope is limited to non-Part 21 aircraft, the CAA has since become aware of some Part 21 GA aircraft that have a similar battery configuration; the assessment will therefore include Part 21 and non-Part 21 GA aircraft.

The CAA will provide an update on the actions taken to address this safety recommendation by October 31st 2024.

AAIB Assessment – Adequate Open