Pegasus Quik, G-CCPC	East Fortune Airfield, East Lothian	01 June 2022	Accident

Investigation Synopsis

During start up, the engine suddenly went to a high rpm. The aircraft accelerated over the ground and became airborne with the base bar attached to the front strut. It struck the ground in a field adjacent to the airfield and the pilot died from head injuries eight days later.

It is likely that the pilot started the engine with the hand throttle open and did not free the base bar, reduce the rpm or stop the engine before the aircraft became airborne. The pilot might have survived if he had been wearing his shoulder (diagonal) harness and his helmet had been designed to protect him from rotational head injuries.

Four Safety Recommendations are made in this report. Two to the CAA to mandate the embodiment of a starter inhibitor switch on the hand throttle, and to review the exception for a shoulder strap not to be worn. Two to the British Standards Institute regarding the design of helmets used for airborne sports. Safety Actions were also taken by the BMAA, Microlight Panel of Examiners and the pilot's flying club.

Safety Recommendation 2023-037

Justification

Following this accident, the aircraft manufacturer prepared SB 159 to classify the starter inhibitor switch as a compulsory modification on their range of flexwing aircraft equipped with an electric starter. To prevent a reoccurrence of this type of accident, the following Safety Recommendation is made to the CAA to require the starter inhibitor switch to be fitted to all electric start, in-service Pegasus Sport Aviation Ltd flexwing aircraft:

Therefore, the following safety recommendation was made:

> **Safety Recommendation 2023-037**
>
> It is recommended that the UK Civil Aviation Authority issue a Mandatory Permit Directive to mandate Pegasus Sport Aviation Ltd Service Bulletin 159 to embody a Starter Inhibitor Switch on all in-service Pegasus Sport Aviation Ltd aircraft .

Date Safety Recommendation made: 30 November 2023

LATEST RESPONSE

Response received: 23 February 2024

The CAA accepts this Safety Recommendation.

The CAA is liaising with the British Microlight Aircraft Association (BMAA) to ensure that Pegasus Sport Aviation Ltd Service Bulletin 159 is complete and correct in its current form. Once this is confirmed the CAA will issue a Mandatory Permit Directive (MPD) to mandate Pegasus Sport Aviation Ltd Service Bulletin 159 for all affected Pegasus Quik and Quantum aircraft.

The CAA will provide an update on the actions taken to address this safety recommendation by the end of June 2024.

Safety Recommendation Status **Open**

AAIB Assessment **Adequate**

Action Status **Planned Action Ongoing Update Due** 08 July 2024

Feedback rationale

The AAIB acknowledges the response which meets the intent of the Safety Recommendation. An update is requested by 8 July 2024. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

N/A

Safety Recommendation 2023-038

Justification

The finding from RAFCAM and the experience of the AAIB that there is a greater risk of serious and fatal injury when a shoulder strap is not worn during an accident, is contrary to the CAA's position that a properly worn lap strap, in combination with a safety helmet, provides adequate protection.
The aircraft manufacturer warns that the full harness should be worn and if correctly adjusted does not compromise full and free control inputs. However, pilots of the Pegasus Quik who expressed concern at wearing the shoulder harness quoted the exception in BCAR Section S 1307 as justification not to wear it. To ensure that the exception in BCAR Section S1307 is still appropriate, the following Safety Recommendation is made to the CAA:

Therefore, the following safety recommendation was made:

> **Safety Recommendation 2023-038**
>
> It is recommended that the UK Civil Aviation Authority review the suitability of the Configuration Specific Provision in British Civil Airworthiness Requirements, Section S 1307 (a) Miscellaneous equipment which states, 'except that only a lap strap need be provided for front seat occupants of a weight-shift controlled aircraft'.

Date Safety Recommendation made: 30 November 2023

LATEST RESPONSE

Response received: 23 February 2024

The CAA accepts this Safety Recommendation.

The CAA has coordinated with the BMAA to assess the suitability of British Civil Airworthiness Requirements (BCAR) Section S 1307 (a), as currently worded, which allows weight-shift controlled aircraft to be designed with only a lap strap for front seat occupants.

Both the CAA and BMAA consider that a change to S 1307 (a) to remove the aforementioned exception for weight-shift aircraft is justified. The next review of BCAR Section S is scheduled to take place in 2025 and will include a proposal to amend S 1307 (a) such that upper torso restraint (UTR) will be required for all occupants. In the meantime, any applicant seeking UK type acceptance/approval for a new weight-shift controlled aircraft will be advised of the forthcoming change to S 1307 (a) and encouraged to include UTR for all seats, if not already part of the design, in advance of the update to BCAR Section S coming into force.

Safety Recommendation Status **Open**

AAIB Assessment **Adequate**

Action Status **Planned Action Ongoing Update Due** 02 June 2025

Feedback rationale

The AAIB acknowledges the response which meets the intent of the Safety Recommendation. An update is requested following the review of BCAR Section S, or by 2 June 2025. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

N/A

Safety Recommendation 2023-039

Justification

The pilot wore a helmet designed to conform to BS EN 966: 2012 'Helmets for airborne sports'. This Standard does not protect wearers from the most likely cause of serious and fatal head injuries in aircraft accidents that result from rotational motion of the head when it is subject to an oblique impact. In this accident, the pilot died from a severe rotational head injury which his helmet was not designed to protect him from. Therefore, to ensure that BS EN 966: 2012 provides protection from oblique impacts that are likely to occur in aircraft accidents, the following Safety Recommendation is made to the BSI:

Therefore, the following safety recommendation was made:

> **Safety Recommendation 2023-039**
>
> It is recommended that the British Standards Institute introduce a requirement in BS EN 966 'Helmets for Airborne Sports' to protect wearers from rotational head injuries.

Date Safety Recommendation made: 30 November 2023

LATEST RESPONSE

Response received: 19 December 2023

CEN/TC 158 'Head Protection' is the European technical committee responsible for standardization in the field of head protection designed to safeguard wearers against known and potential hazards that cause head injuries.

A body of work is currently underway in CEN/TC 158/WG 11 'Headforms and test methods' on a new draft standard. The headforms being developed are intended to replace the current EN 960 headform (which is referenced in EN 966 'Helmets for Airborne Sports'). The new headform is intended to provide more humanlike engagement with the helmet and impact response especially for oblique impacts whilst also extending the measurement capability to include angular velocities.

Once EN 17950 is published, reference to the new equipment and test methods, along with assessment criteria for the protection provided by the helmet can then be included in each of the activity specific standards, including EN 966 Helmets for airborne sports, when the standards are revised / amended.

Safety Recommendation Status **Open**

AAIB Assessment **Adequate**

Action Status **Planned Action Ongoing Update Due** 31 December 2024

Feedback rationale

The AAIB acknowledges the response which meets the intent of the Safety Recommendation. An update on the progress of the actions being taken is requested by 31 December 2024. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

N/A

Safety Recommendation 2023-040

Justification

The helmet worn by the pilot was categorised for use in ultralight aircraft; however, this term has not been defined by either the BSI or the CAA. To ensure microlight pilots select helmets suitable for their airborne activity, the following Safety Recommendation is made to the BSI:

Therefore, the following safety recommendation was made:

> **Safety Recommendation 2023-040**
>
> It is recommended that the British Standards Institute adopts the definition of a microlight from Schedule 1 of the Air Navigation Order (UK Statutory Instruments No. 765) in BS EN 966 'Helmets for Airborne Sports'.

Date Safety Recommendation made: 30 November 2023

LATEST RESPONSE

Response received: 19 December 2023

As part of a request for revision / amendment to EN 966, the committee can suggest incorporation of the relevant definition of a microlight as given in UK Statutory Instrument no. 765. However, as this is a European standard it is expected that where other definitions exist within the EEA these are likely to also be considered.

A copy of the AAIB report and the Safety Recommendation transmittal letter regarding UKAAIB Safety Recommendations 2023-039 and 2023-040 will be circulated by BSI to members of national committees PH/6 ‘Head protection’ and PH/6/6 ‘Protective helmets for sports and leisure’. A copy of this response will also be circulated for the committees reference.

A copy of the AAIB Bulletin will also be circulated by BSI to the committee manager and Chair of European Technical Committee CEN/TC 158 ‘Head protection’ for their information.

Safety Recommendation Status **Open**

AAIB Assessment **Adequate**

Action Status **Planned Action Ongoing Update Due** 31 December 2024

Feedback rationale

The AAIB acknowledges the response. An update on the progress to address this Safety Recommendation to adopt the definition of a microlight in the Air Navigation Order in BS EN 966 is required by 31 December 2024. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

N/A