

**Boeing 787-9,
G-ZBKF**

**London Heathrow
Airport**

01 October 2020

Serious Incident

Investigation Synopsis

The aircraft was approaching the top of descent when the cabin crew saw smoke emanating from a passenger seat. It was discovered that a mobile phone had fallen down the side of the seat and had been crushed in the seat mechanism. The cabin crew extinguished the fire and the aircraft continued to its destination. There was no damage to the aircraft.

There have been several reports of similar events occurring leading to smoke in the cabin. There are currently no seat design requirements to prevent electronic devices from becoming trapped in seats. Manufacturers and regulators are aware of this issue but it has proven challenging to find a workable solution. The EASA and the SAE International Seat Committee have taken safety action to develop new design standards and recommended practices. A safety recommendation is made to the CAA to improve seat design regulations.

Safety Recommendation 2021-017

Justification

Portable electronic devices becoming crushed in seat mechanisms are a fire hazard. There are currently no requirements to prevent this.

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-017

It is recommended that the Civil Aviation Authority require that passenger seats in commercial air transport aircraft are designed to minimise the chance of portable electronic devices becoming crushed in mechanisms.

Date Safety Recommendation made: 08 April 2021

LATEST RESPONSE

Response received: 23 November 2023

The UK CAA design and certification specialists are actively attending the SAE1 International Seat Committee meetings to discuss the entrapment of Portable Electronic Devices (PED) and how this can be mitigated. In addition, guidance is being drafted to prevent entrapment of occupant limbs within seat mechanisms, and many of the mitigating factors would have a positive impact on PED entrapment.

The committee are reviewing the minimum performance standards for seats, with the view to taking recently published recommended practise from (Society of Automotive Engineers Inc) SAE ARP5526 Rev F, section 3.30 (object entrapment) and including as a requirement within SAE AS8049, which would be referenced in a future revision of (Certification Specification - European Technical Standard Order) CS-ETSO2 (ETSO-C127). AS 8049 is currently being re-worked to convert the document into a set of requirements shown in a compliance matrix format.

For reference, the current revision of seat TSO within the UK system is currently C127b, which references ARP5526 Rev C. We are currently consulting on the introduction of C127c, which references ARP5526 Rev D, which aligns us with both EASA and the FAA. Note that object entrapment is not introduced until ARP5526 Rev F, so this update would not levy any requirements relating to object entrapment.

It should also be noted that referencing object entrapment within the TSO minimum performance standards would only be applicable to the equipment so would not fully mitigate scenarios involving other installations (e.g. seat furniture, monuments etc). To fully mitigate this, we are investigating including requirements at the installation level (e.g. CS-23/25/27/29 etc).

The UK CAA specialists have also started to engage with other regulators with a view to harmonise the approach to introducing requirements to prevent PED entrapment. The FAA have recently released an AMOC (<https://www.govinfo.gov/content/pkg/FR-2023-08-04/pdf/2023-16094.pdf>) which allows the use of SAE AS6960, section 3.2.3 (object entrapment) as an acceptable means of compliance to 25.601 and 25.1301(a)(4). EASA are considering other options such as referencing PED entrapment (not just for seats) in the next issue of CS25 as an AMC to 25.601 and/or 25.1301(a)(4) and/or referencing ARP5526 Rev F 3.30 in their up-issue of CS-ETSO 127c to CS-ETSO 127d as an amendment to the standards. It is the UK CAA intention to work closely with EASA as UK CAA share concurrence in the approach which will ensure harmonisation.

The UK CAA will continue to monitor PED entrapment events through the requirements of CAA Regulation UK Reg (EU) 376/2014 (as retained and amended in UK domestic Law under the European Union withdrawal Act 2018), through its engagement in the SAE seat committee and discussion with other regulators.

In light of the aforementioned, we propose the next update to AAIB is provided before the end of May 2024.

Safety Recommendation Status	Open
AAIB Assessment	Partially Adequate
Action Status	Planned Action Ongoing Update Due 31 May 2024

Feedback rationale

The AAIB acknowledges the detailed update and the progress reported to date, and looks forward to a further update at the end of May 2024.

RESPONSE HISTORY

Response received: 03 May 2023

The UK CAA design specialist has now started to attend SAE1 International Seat Committee meetings to raise and discuss the entrapment of Portable Electronic Devices (PED) and how this can be mitigated.

The committee have agreed to review and discuss the minimum performance standards for seats, with the view to amending either SAE ARP5526 or SAE AS8049, which may be referenced in a future revision of CS-ETSO - Certification Specification - European Technical Standard Order (ETSO-C127).

The CAA will continue to monitor PED entrapment events through the requirements of CAA Regulation UK Reg (EU) 376/2014 (as retained and amended in UK domestic Law under the European Union withdrawal Act 2018) and through its engagement in the SAE (Society of Automotive Engineers, Inc) seat committee.

Considering the aforementioned, we propose the next update to AAIB is provided before the end of November 2023.

AAIB Assessment – Partially Adequate Open

Response received: 02 September 2022

As previously stated, the CAA has strengthened the UK State of Design capability by recruiting design specialists who are collaborating with other authorities and participating in the SAE (Society of Automotive Engineers, Inc) International Seat Committee which is engaged in the design of seats for commercial air transport aircraft, and where appropriate, are making recommendations to minimise the chance of portable electronic devices becoming crushed in mechanisms.

The SAE seat committee and other international regulators recognise the risks that Portable Electronic Devices (PED) entrapment present and these risks have been discussed. The SAE seat committee have developed the following guidance material after presentations were provided by EASA on serious incident G-ZBKF:

“Small objects brought by the passenger (i.e., cell phones, PC tablets, computers, wallets, chargers, cords, keys, etc.) shall not be able to migrate to a location in the seat or furnishing where the object may prevent the return of critical features to a TTL (Take off, Taxi, Landing) position or create a potential fire hazard due to being crushed.

Seat furnishings shall be designed so that small objects are easily retrievable if they migrate into the seat or furniture structure. This may be done by prevention (seals, brushes, or shrouds), or the object can fall into an accessible area for retrieval. For any area that allows items to fall to the floor under or around a Seat Furnishing, there must be adequate access (removal of panels by crew member, by extending features such as a legrest, etc.) to allow the crew member to retrieve them.”

Currently this guidance material is located within SAE AS6960 - Performance Standard for Seat Furnishings in Transport Aircraft. The intention from the international regulatory community is for this material to be included within the minimum performance standards for seats, within either SAE ARP5526 or SAE AS8049, which may be referenced in a future revision of CS-ETSO (Certification Specification – European Technical Standard Order) (ETSO-C127).

The CAA continue to monitor PED entrapment events through the requirements of CAA Regulation UK Reg (EU) 376/2014 (as retained and amended in UK domestic Law under the European Union withdrawal Act 2018) and through its engagement in the SAE seat committee. The next steps for the SAE committee is to revise SAE ARP5526 or AS8049 after which the CAA would consider how to adopt the revised standards.

We will continue to monitor progress and changes through the SAE working group, with the next committee meeting taking place in March 2023. In addition, our design and certification specialists are raising the risks of PED entrapment with UK state of design organisations for their awareness and consideration during their certification projects.

In light of the aforementioned, we propose the next update to AAIB is provided before the end of April 2023.

AAIB Assessment – Partially Adequate Open

Response received: 08 February 2022

The CAA has continued to strengthen the UK State of Design capability recruiting Design Specialists who will be able to engage with other authorities and seek participation in the SAE International Seat Committee to the design of seats for commercial air transport aircraft and where appropriate to make recommendations to minimise the chance of portable electronic devices becoming crushed in mechanisms.

The evolution of seat design standards will only be effective when agreed on a global basis. The UK CAA will continue to work with other lead international regulatory authorities to review and support future amendments and updates to the Certification Specifications and / or recommended practices.

The CAA continue to monitor similar PED entrapment events through the requirements of CAA Regulation (EU) 376/2014 (as retained and amended in UK domestic Law under the European Union withdrawal Act 2018) and through its engagement in the SAE committee. Currently the CAA do not envisage an immediate change to the Certification Specifications or Recommended Practices to aircraft seat design. We will continue to monitor progress and changes through the SAE working group.

AAIB Assessment – Not Adequate Open

Response received: 14 July 2021

The CAA partially accepts this recommendation and supports the Safety Action taken by EASA in regard to requesting the SAE International Seat Committee develop design standards and/or recommended practices in relation to the design of seats for commercial air transport aircraft to minimise the chance of portable electronic devices becoming crushed in mechanisms.

Evolution of seat design standards will benefit from a global position and the CAA will work with the international regulatory community to review supporting evidence and global data that may support future amendments to global and UK Certification Specification and/or recommended practices.

AAIB Assessment – Partially Adequate Open