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**Safety Recommendation:**

The European Aviation Safety Agency should conduct a safety study in relation to the most effective method of occupant restraint in aircraft engaged in parachute operations and consider whether the applicable EU Regulations and Certification Specifications adequately address the safety restraint of parachutists.

**Response:**

16 November 2015: The AAIU received the following response from EASA;

The technical installation of restraints systems are addressed in the Certification Specifications CS-23 supplemented by special condition "Use of aeroplanes for parachuting activities" (Doc. No. SC-023-div-01).

EASA is investigating whether such requirements are sufficient to determine the most effective restraint system for parachute operations, or whether further requirements, and ultimately research activities, are necessary.

21 July 2016: EASA further updated the AAIU by letter as follows;  
Conclusion of the EASA Investigation is foreseen by the end of 2017.

20 May 2018: EASA provided a further update to the AAIU by Email advising that;  
"EASA is still working on this issue. An internal investigation encompassing the following aspects has started:

- Assessment of the issues
- Review of the regulation framework
- Analysis of occurrence data
- Survey with European Parachute Associations
- Conclusions and actions on the:
  - o need to mandate restraint system
  - o need to further define design requirements for restraint systems, and
  - o need to mandate pilot back protection

The investigation is almost completed and the response to the safety Recommendation will be provided accordingly."

22 November 2018: EASA further updated the AAIU by letter as follows; "EASA has performed a study on the effectiveness of restraint systems provided for parachutists, starting with the operating requirements (as defined in commission Regulation (EU) No 965/2012) and the technical requirements (as defined in the Certification Specifications CS-23 and Special Condition 'Use of aeroplanes for parachuting activities', doc. No. SC-023-div-01) for their selection and installation.

The study included:

- a review of the current regulatory framework;
- an analysis of occurrence data in the last 11.5 years covering parachute operations with aircraft registered in EASA member states;
- a survey with a sample of European parachute associations;
- an assessment of different type of restraint system including the advantages and the disadvantages; and
- a review of the available research material for parachutists' restraint systems;

The conclusions of the study are summarised as follows:

The restraint systems are primarily aimed to keep the parachutists in place during critical phases of flight before jumping, in order to maintain the centre of gravity (CG) within the envelope. It is highlighted that the CG envelope can also be protected with alternative means (e.g. handles for parachutists using the aeroplane floor as a station). The restraint systems also provide protection in case of an emergency landing with parachutists still on board, or an aborted take-off or in-flight turbulence. However, there are disadvantages in the use of restraint systems, due to the potential for snagging and other interference with the parachutist's harness), depending on the aircraft model and configuration.

The available methods of restraint systems can be more or less effective depending on factors, such as the parachutists' position (e.g. aft or forward facing) and aircraft size etc. For example, the most effective method (from a crashworthiness protection point of view) uses restraint systems with dual attachment points. On the other hand, such a solution presents the disadvantage that it takes longer to unfasten, and it may create an impediment on the aircraft floor during the jumping phase and in case of emergency evacuation on the ground after landing. A single attachment point can provide, in some cases (e.g. in light aircraft) a better solution, considering also the fact that it provides a faster single point release.

EASA has concluded that the use of restraint systems for parachutists has advantages and disadvantages, and the current regulatory framework, according to which the selection of the most appropriate type of restraint systems (and the decision to install them or to use a means to hold or strap on instead, for parachutists using the aeroplane floor as a station) is part of the risk assessment by the operator (as required by SPO.OP.230 of Part-SPO (Specialised Operations) of Commission Regulation (EU) No 965/2012, is appropriate.

As a result of the study, EASA has taken the following actions:

EASA Safety Information Bulletin SIB 2018-18 has been issued providing guidance on restraint systems for parachutists, and supporting operators and designers in the

installation and use of restraint systems, and in the selection of the most appropriate type of restraint systems.

Special Condition SC-023-div-01 “Use of aeroplanes for parachuting activities” has been revised to clarify the installation requirements for restraint systems.

The review of occurrence data and the service experience data from the parachute associations does not warrant further actions. In particular the review has shown that in the occurrences analysed (96 occurrences including accidents and serious incidents) in the last 11.5 years, no fatality of parachutists has occurred in these accidents that are classified as survivable, and that the use of restraint system would have increased the survivability rate. An important aspect is that in 68% of the total number of occurrences, the parachutists had jumped out and avoided the consequence of the contact (or impact) with the ground”.

**AAIU Comment:**

23 May 2018 - The AAIU notes the responses of EASA to date regarding this Safety Recommendation and awaits further response. Response text will be updated pending further information from EASA.

22 November 2018 - The AAIU considers the status of this recommendation to be one of "Implemented Closed".