

## Equivalent Safety Finding

Doc. No. :

Issue : 1

Date : 14 Jun 2019

Proposed : ☒

Deadline for comments: 05 Jul 2019

Final with CRD ☐ without CRD ☐

**SUBJECT** : **Type A+ Emergency Exits**  
**REQUIREMENTS incl. Amdt.** : **CS 25.807(g) Amdt. 20**  
**ASSOCIATED IM/AMC<sup>1</sup>** : Yes ☐ / No ☒  
**ADVISORY MATERIAL** : **AMC 25.803, AMC 25.807 Amdt. 20**

### Introductory Note

The following Equivalent Safety Finding has been classified as important and as such shall be subject to public consultation in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) which states:

*"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."*

### Identification of Issue

A request for an Equivalent Safety Finding (ESF) was submitted to EASA in order to increase the Maximum Passenger Seating Capacity (MPSC) of a dual aisle aircraft beyond the MPSC value of 440 which is obtained according to the CS 25.807(g) at CS-25 amendment 20.

Type A emergency exits were introduced by the FAA into FAR 25.807 with Amdt 15 (1967), with a credit of 100 passenger seats per pair of exits, which was subsequently increased to 110 with FAR 25 Amdt 39 (1977). JAA adopted the requirements of FAR 25 Amdt 39 in JAR 25 Change 4 (1978). Since then, the maximum number of passenger seats permitted by JAR and CS-25 for each pair of Type A emergency exits has remained unchanged.

Notwithstanding the improvements introduced in the meantime in the "state of the art" Type A emergency exit design (e.g. escape slides performance, door opening time, etc.), EASA does still consider the maximum number of passenger seats (i.e. 110) allowed by CS 25.807(g) per pair of Type A emergency exits as appropriate.

### Applicant's proposed Equivalent Safety Finding

The applicant intends not to comply with CS.25 807(g) and to compensate this by taking credit for a higher number of passenger seats per pair of Type A exit through the introduction of design and operational requirements over and above those associated with a Type A exit.

<sup>1</sup> In case of SC, the associated Interpretative Material and/or Acceptable Means of Compliance may be published for awareness only and they are not subject to public consultation.

The resultant emergency exit, with its associated additional design and operational requirements, has for working purposes been given the term “Type A+”.

According to the applicant, such Type A+ emergency exits will feature the following improvements with the aim to ease the formation of two parallel evacuation lines and facilitate the transition from door sill to slide:

- 3 cabin crew members at each Type A+ exit pair instead of the 2 that are the standard for a Type A exit pair. This will ensure the presence of 2 cabin crew members in the two assist spaces located forward and aft of the passageway leading to the active exit of the pair. Procedures will be developed to ensure that the performance expected for a pair of Type A+ emergency exits is reliably achieved.
- Escape slides meeting the technical conditions specified in ETSO-C69c.  
Note: ETSO-C69c was issued on 24th October 2003, therefore the implementation of Type A+ emergency exits on large aeroplane models certified before that date will result in the need to improve the slide design.
- Extra Lighting System (ELS) composed of
  - Enhanced LED Baseline Lighting
  - Head-end lane marking arrows
  - Head-end cliff lights
  - Lane Divider Lighting
  - Toe-end cliff light
  - Guide away lights
  - Note: on canted units, a “Scratch Line” shows the transition between porch and sliding surface
- Special Exit Sign

In addition it is intended to demonstrate that the escape slides are automatically erected within 10 seconds from the time the opening means of the exit is actuated.

The applicant intends to demonstrate through an extensive testing campaign that the Type A+ emergency exit definition given above has an increased performance compared to a Type A emergency exit and therefore can be considered adequate to allow transportation of more than 110 passengers per Type A+ exit pair.

### Assessment of the proposed ESF

EASA has carefully reviewed the ESF request submitted by the applicant.

The design features included in the proposed Type A+ emergency exit definition provide for an increased evacuation performance compared to a design meeting the requirements for a Type A emergency exit. This is expected mainly through the reduction of evacuee hesitation times, due to the improved visibility of the escape slide lanes and area of contact with the ground.

The added value given by most of the design features in question depend on the outside lighting conditions, i.e. in daylight conditions the added value of the enhanced lighting systems installed on the Type A+ escape slide would be minimised.

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However, the presence of three cabin crew members per Type A+ emergency exit pair may appreciably improve the cabin emergency evacuation performance, regardless of the outside lighting conditions. To achieve this objective, effective procedures for the cabin crew members responsible for a pair of Type A+ emergency exits need to be developed.

The demonstration of the increase performance of Type A+ emergency exits shall be based on testing.

EASA therefore accepts an ESF for CS 25.807(g), allowing an increase of the number of passenger seats for each pair of Type A+ emergency exits but not beyond 120 passenger seats, provided that the requirements reported below are met.

Considering all the above, the following Equivalent Safety Finding is proposed:



**EQUIVALENT SAFETY FINDING to CS 25.807(g) amdt 20**

**Type A+ Emergency Exits**

**1. Definition of the design and operation of a Type A+ emergency exit.**

- (a) The Type A+ emergency exit shall meet all the requirements applicable to Type A emergency exits included in CS 25.807, 25.809, 25.810, 25.811, 25.812 and 25.813 amdt. 20, and all relevant Special Conditions and Equivalent Safety Findings as per the applicable type certification basis.
- (b) The design of the Type A+ emergency exit type shall include marking and lighting features to delineate the following under all lighting conditions:
  - (i) Indication on where a passenger should enter the slide and strike the slide after the jump for each lane;
  - (ii) Slide lane division;
  - (iii) The point that the slide transitions from the sill to the sliding portion, if applicable;
  - (iv) The end of the sliding portion; and
  - (v) The path leading away from each lane at the bottom of the slide.
- (c) Each Type A+ emergency exit shall be equipped with an escape slide meeting the technical conditions specified in ETSO-C69c or its subsequent revisions.
- (d) Assisting means installed at Type A+ exits shall be automatically erected within 10 seconds from the time the opening means of the exit is actuated.
- (e) There shall be a minimum of three cabin crew members stationed at each pair of Type A+ emergency exits.
- (f) For the cabin crew members required by (e), procedures shall be specified in order to ensure that two cabin crew members are able to occupy the assist spaces available at one of the two doors of the Type A+ emergency exit pair.
- (g) Each seat designated for use during take-off and landing by a cabin crew member required by (e) shall be located near the type A+ emergency exit. A cabin crew member seat shall be located adjacent to each Type A+ emergency exit.
- (h) The AFM shall include limitations and procedures that address the requirements in (e) and (f).

**2. Demonstration of increased performance of a Type A+ emergency exit.**

- (a) The increase in performance of a Type A+ emergency exit with respect to that of a Type A emergency exit shall be quantified and demonstrated through comparative testing, taking into account also the different performance of emergency exits located at the ends of the cabin (fed by two flows) and in the middle of the cabin (fed by three flows). The degree to which an exit can sustain three flows in actual practice shall also be considered. The maximum number of passenger seats permitted for each pair of Type A+ emergency exits (a pair being two emergency exits, one installed on each side of the fuselage) will not be above 120, irrespective of the demonstrated increase in performance.

- (b) It shall be demonstrated by test that the increase in evacuation performance of the Type A+ emergency exit with respect to that of a Type A emergency exit is achieved regardless of the outside lighting conditions. The testing campaign shall be designed to identify the added value given by the design and operational improvements of the Type A+, individually (e.g. cabin crew members required by (1.(e)) or in combination (e.g. design features required by (1.(b)))).
- (c) The effectiveness of the cabin crew tasks required by 1.(f) shall be demonstrated by testing.
- (d) It shall be demonstrated that the aeroplane equipped with one or more pairs of Type A+ emergency exits, meets the requirements of CS 25.803, for the desired increased MPSC. In the testing conducted to show compliance with CS 25.803(c), it is expected that the effectiveness of the tasks required by 1.(f) is confirmed.