



COMMENT RESPONSE DOCUMENT

**EASA CRD of ESF on CS 25.807(b), (c) ; CS 25.813[c(2)(i)] ; CS25.813[c(4)(i)] at Amdt 15
Applicable to Airbus A321-27xNX/-25xNX models
[Published on 13 March 2017 and officially closed for comments on 03 April 2017]**

Commenter 1: TCCA – Christopher Schofield / Senior Engineer / Occupant Safety & Environmental Systems – 03 April 2017

Comment # 1 - General

The ESF proposes to allow a significantly smaller passageway within the exit opening than is required by EASA's current standards (CS 25.813(c)(2)(i)) on the basis that the exit is oversized and testing will be conducted to show that the evacuation performance (evacuation flow rate) is at a comparable level to that of a configuration meeting the current standards.

EASA response: NOTED

The relative positioning of the exits is unchanged when compared to the current configurations installed on A320 and A319 (dual exits arrangement). The proposed reduction in the passageway/exit overlap is already an approved configuration on all current designs for Airbus Single Aisle.

Comment # 2 - General

TCCA has recently commented upon another proposed EASA ESF on CS 25.807(g)(1) and CS 25.807(g)(7) at Amendment 15.

This ESF, if its conditions are met, would allow additional passenger seat numbers for the Type III exit(s). It is not clear from either ESF proposal whether both ESFs would be applied to a single aircraft or are they to be defined as incompatible.

EASA response: NOTED

The ESF under consultation does not grant any additional passenger seats, but it constitutes a pre-requisite to be complied with for each configuration (either single or dual exit arrangement) planned to be certified by Airbus. Nevertheless, the ESFs are not incompatible and there are particular configurations where both have to be complied with.



Comment # 3 - General

TCCA [also] does not see any compensating features to justify the ESF for the forward exit in particular.

The 5 inches of additional exit height is the only physical characteristic that exceeds the standards. And the seat cushion protrusion removes some of this benefit.

The current TCCA airworthiness standards for 25.813(c) are not harmonized with EASA's. The passageway width required is 20 inches rather than 13 inches (although TCCA has granted ESFs allowing the use of 13 inch passageways). As well the TCCA standards require the passageway and exit opening centerlines to be offset a maximum of 5 inches. This is significantly different than EASA's standards in this regard. This difference in standards would need to be taken into consideration when reviewing any similar ESF application to TCCA.

EASA response: PARTIALLY AGREED

While meeting the step-up and step-down distances required by CS 25.807[a(3)] , the projected opening provided (taking into considering the maximum seat cushion encroachment) is still 3 inches bigger in height than the minimum standard dimensions as required by the regulation.

TCCA will address the differences with the EASA's standards in the frame of a potential future validation exercise.

Comment # 4 – Design proposal

Airbus was assessing the Step-up requirements from the floor to the top of the seat cushion but that for the Step-down requirement the assessment was made from the actual door sill to the wing surface. It is not clear how this difference in approach to assessing the Step-up and Step-down is rationalized as acceptable.

Because the seat occupies a large portion of the physical exit opening, it is likely that many evacuees will step onto the seat cushion and hence for those evacuees the step down will be from that height and not the door sill.

EASA response: PARTIALLY AGREED

In consideration of how the text of the proposed ESF the comment is relevant. However, after further discussions with Airbus, it has been clarified that taking into consideration the maximum seat cushion encroachment, the step-up and step-down distances required by CS 25.807[a(3)] are still met for both exits with the maximum cushion's compression allowed by the AC 25-17A. This implies a relocation of the bottom of the required exit's opening 2 inches above of the available exit's opening.

Comment # 5 – Conditions for the acceptance of the ESF

The conditions to apply to all Type III exit arrangements foreseen deal with the seat cushion protrusion into the projected opening of the physical exit.



If TCCA understands the proposal correctly the protrusion of the seat cushion into the projected opening of the 20x41 inch exit by up to 4" will not affect compliance with CS 25.807(b) when CS25.807(c) is applied.

Hence the first condition to assess the potential for interference of the seat with the operation of the Over Wing Exit is understood.

The second condition that the seat cushion material be easily compressible is not fully understood.

TCCA requests EASA to elaborate on the means by which this cushion compression would be applied and controlled.

EASA response: NOTED

The ESF is designed as to consider only 2 inches of compressible seat's cushion.

Refer to responses to Comment #3 and Comment #4.

A dedicated control drawing will be part of the Type Design and will be included in the Seat Frame Specification.

Comment # 6 – Conditions for the acceptance of the ESF

Conditions that apply only to the forward exit of a dual Type III exit arrangement

The primary condition that applies only to the forward exit of a dual Type III exit arrangement is the comparative testing.

It is not clear what EASA intends as a comparable level.

What will the performance level criteria be for this comparison (for example passenger flow rate)?

As well it is not clear what the baseline configuration would be for these tests : Would it be the same exit (oversized – same step up and step down) with the same seat cushion intrusion in the vertical plane but with a passageway meeting CS 25.813(c)(2)(i)?

TCCA has a concern that the passenger behaviour in negotiating the transitioning from the 13 inch passageway to the significantly offset exit opening over the seat be closely examined during the testing, such as, the transition time from the aisle to the entrance to the slide, test data repeatability.

EASA response: NOTED

The benchmark for the testing will be the standard Type III exits' arrangement as defined by CS 25.813[c(2)(i)], CS 25.807[a(3)] and AC 25-17A to be compared with the forward exit of a dual Type III exit's arrangement.

Performance criteria for comparison will be the flow rate. Data will be also collected to measure the influence of the exit's arrangement on the passengers' performances in going through the exit. Testing will be conducted to demonstrate with an acceptable level of confidence that the performance of the new arrangement will be equal or better than the minimum standard.



Commenter 2: Boeing Commercial Airplanes – Terry L. McVenes, / Director / System Safety & Regulatory Affairs – 03 April 2017

Comment # 1 - General

[Boeing Commercial Airplanes] have previously explained [their] position in comment[ing] [...] ESF [D-13] on Emergency exits: CS 25.807g(1) and g(7) at Amdt 15; Applicable Airbus A321-27xNX/-25xNX [...] : [Boeing Commercial Airplanes] position states that the high step up and step down heights combined with the relatively small exit opening make Type III exits more difficult to use by older and mobility-impaired persons than other exit types. This would be made even worse if the passageway is further offset from what is currently allowed by EASA regulations (as is proposed by the subject ESF (D-11)).

EASA response: DISAGREED

Taking into consideration the maximum seat cushion encroachment, the step-up and step-down distances required by CS 25.807[a(3)] are still met for both exits with the maximum cushion's compression allowed by the AC 25-17A.

The gender – age – size issue was not considered in past certification projects and conditions for testing are defined in Appendix J of CS 25 Amdt 15.

Commenter 3: FAA – Sanjay Ralhan / Program Manager / Transport Airplane Directorate - International Branch / Aircraft Certification Services – 03 April 2017

Comment # 1 - Design

We concur with the proposed ELOS with the exception of the 10.5" offset between the centerline of the exit and the centerline of the passageway. We have only accepted this amount of offset on aircraft models that do not include amendment 25-76 of 14 Code of Federal Regulation 25.813.

EASA response: NOTED

The 10.5 inches offset has already been accepted by EASA in the past (CRI E2105) on previously certified models where the applicable requirements did not include a minimum value for the passageway and allowed offsets between the centerline of the exit and the centerline of the passageway.

As per the amendment level of the applicable EASA regulation (CS 25.813[c(2)]) the maximum offset would be 6.5 inches. The increased offset applied through the ESF will be demonstrated by means of adequate testing.

