

Equivalent Safety Finding D-21 on “Emergency exit access”: CS 25.813(c)(2) at Amdt 15

Applicable to Airbus A321-27xNX/-25xNX

Introductory Note:

The hereby presented Equivalent Safety Finding has been classified as an important Equivalent Safety Finding 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.) of 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."

Statement of Issue:

The proposed Airbus A321-27xNX/-25xNX cabin layout is made of 76 seats that are electrically actuated and that can be driven to full flat (bed) position.

The cabin exits arrangement includes the activation of one pair of oversized Type III automatic opening doors over the wing, in order to ensure compliance with the CS 25.807(f)(4) “60ft rule”.

When a seat located in the vicinity of the Type III exits is actuated towards the bed position, this creates an obstruction of the passageway resulting in a non-compliance to CS 25.813(c)(2) at Amdt 15. Nevertheless, when the seat is in Taxi, Take-Off and Landing (TTOL) position, the seat installation is in compliance with CS 25.813(c)(2) with no obstruction of the required passageway to the over-wing exit.

The applicant proposes an equivalent safety finding to address the above mentioned non-compliance.

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The equivalence justification below details the means and provisions (i.e. the compensating factors) that the applicant intends to use to demonstrate an equivalent level of safety.

Design / Analysis proposal

- The seats will be installed at the over-wing exit in full respect of the ESF D-11 “Over wing Type III exit interior arrangement”.
- The seat installation will be in accordance with CS25.813(c)(2) when the seat is in Taxi, Take-Off and Landing (TTOL) position.
- At least 25.4 cm (10 inches) of the required passageway width will be within the projected opening width of the exit and a 13” wide passageway will be maintained in TTOL.

- The seat configuration at the Type III over wing exit will always ensure that the base of the exit can be used as a step, regardless if the seat is in TTOL or in bed position.
- The seat at the over-wing exit will be electrically actuated. A feature will be installed allowing the cabin crew to deactivate the seat from the cabin attendant position. This deactivation can easily be performed before preparing the cabin for TTOL.
- Information of the flight phase and the status of a switch on the Flight Attendant Panel (FAP) will be routed to the seat. The logic will be the following:
 - The status of this switch as well as the “landing gear extended” and the “flaps in TTOL position” information will be routed to the seat.
 - The switch, when engaged, powers the Portable Electronic Devices (PED) outlets units of the seats and allows full functionality of the seat actuation system. When this switch is disengaged power is removed from the PED outlets units and the seat actuation system is restricted such that only the “TTOL” switch of the seat actuation system is powered. Then, in any position of the seat, the seat can only be driven back to TTOL position, or, when in TTOL position, the seat cannot be driven out of that position.
 - The same logic automatically applies if either the landing gear is extended or the flaps are set to their TTOL position.
- Forward and aft floor level exits will be equipped with either wide slides or slide/rafts as per A321-27xNX/-25xNX type certificate.
- The seats will have a mechanical override to bring them in the TTOL position in case of power loss. This mechanical override is not easily accessible to the passenger.
- The A321-27xNX/-25xNX is equipped with Type III over-wing automatic opening exits. These exits are top-hinged and open to the outside such that any interference with interior design is excluded.

Procedure implementation

- A limitation will be included in the “Cabin Instructions and Limitations List” (CIL), and referenced in the Airplane Flight Manual (AFM), mandating the Cabin Crew (CC) to disengage the seat power prior to the cabin preparation for TTOL to ensure the seats cannot be driven out of their TTOL position.
- The CC will check that all seats are in their TTOL position as per the normal cabin procedure.
- For the proposed MPSC of 76, the minimum required CC would be 2 based on the operational requirement. A limitation will be included in the “Cabin Instructions and Limitations List” (CIL), and referenced in the Airplane Flight Manual (AFM), that the Minimum Cabin Crew is 3. The additional CC will be mandated to have the dedicated duty to disengage the seat power before checking the seating configuration at the Type III over-wing exit when the cabin is prepared for TTOL. If needed, this CC will also perform the manual override to bring the seats in the over-wing exit row to the TTOL position.

Applicant Safety Equivalency Demonstration:

- According to CRI D-17, the theoretical maximum seating capacity in the door configuration C₆₅-III-C₆₅ is 165 (allocating a rating of 35 to the Type III over-wing exit). The actual proposed seating capacity of 76 is a reduction by a factor of more than 2 of the theoretical maximum.
- The configuration of both the forward and the aft floor level exits is in accordance with CRI D-09 “Increase of seats’ credit for oversized Type I (qualified to Type C) floor level exits”, granting a rating of 65 passenger. For the proposed MPSC of 76, the evacuation performance will be demonstrated by a combination of analysis and testing with substantial margins, in compliance to 25.803(c), without taking any credit of the evacuation performance of the single Type III over-wing exit.

- Irrespective of the status of the seats at the exit row (TTOL position, full flat bed position, or any position in between) it will be ensured that there is an unobstructed Type III exit opening as required by 25.807(a)(3) available, and useable for evacuation, such that compliance to CS25.807(f)(4) ("60 feet rule") is always maintained.