

**DOCKET FAA-2003-14193**  
**14 CFR Part 25: Design Standards for Fuselage Doors on**  
**Transport Category Aircraft**

I have significant design experience with cabin doors for a major transport category aircraft manufacturer. These comments are submitted as an individual and do not necessarily represent the views of that manufacturer.

The proposed rules are an overall enhancement of safety and improve clarity over the currently published rules, and along with the Draft Advisory Circular 25.783-1X, will reduce the amount of field interpretation needed by both the manufacturers and FAA personnel. However, the proposed rules can be further improved by the following recommendations, one technical in nature and the remainder regarding word usage. Incorporation of these comments will require similar changes to the draft AC; no separate or additional comments on the content of the AC are being submitted at this time.

**TECHNICAL COMMENT: 25.783(b) *Opening by persons.***

The requirement for design precautions to minimize the possibility of a person *intentionally* opening a door in flight is difficult to reliably achieve using purely passive means such as pressure differential. Such passive means increase the risk that a door may not be operable in certain environmental and emergency conditions because the operating system must be designed with limited mechanical advantage. Likewise, auxiliary devices inherently add failure modes that can prevent critical egress, as acknowledged by paragraphs (b)(1) & (2), which limit the probability and number of exits affected by such failures.

The intentional opening requirement disproportionately impacts safety on small transport category aircraft with 19 or fewer passenger seats, because 25.807(d) only requires a single exit on either side of the fuselage. Therefore the intentional opening prevention means may limit egress through half of the escape routes and entirely eliminate exit options on one side of the fuselage. By comparison, an aircraft with more than 19 seats will at most lose egress from 25% of the exits, and will always have at least one exit available on each side.

In addition, aircraft with 19 or fewer passenger seats have less risk of an intentional opening event because:

1. It is difficult for a passenger to approach the door unchallenged as the small and undivided cabin is easily observed by an attendant and other passengers.
2. Small aircraft make up most of the Part 91 and Part 135 operations conducted by transport category aircraft, and these operations typically have passengers who are better known to the operator.
3. A very small percentage of total passenger volume is on small aircraft, and flights are typically shorter. An even smaller percentage of Part 121 operations occurs on these aircraft, so the general public has little exposure.

Changing the 25.807(d) requirements to include more exits for small aircraft does not appear to be warranted based on these reduced risks and substantial historical evidence that two exits are adequate for these passenger loads.

**Recommendation:** Overall safety would be enhanced by limiting the *intentional* opening requirement to aircraft with more than 19 passenger seats. (Safeguards against *inadvertent* opening should continue to apply to all aircraft.)

#### **WORD USAGE COMMENTS:**

The words “each” and “any” are used inconsistently in the proposed rules, and need to be reviewed to prevent ambiguity. Based on usage found in other published rules and dictionary definitions, “each” typically means “every” or “all” considered in aggregate or combination, while “any” indicates “one” selected without restriction and considered individually.

**25.783(a)(1)** “Each door” means “every door,” and is acceptable. If the second “each” also means “every,” then “failure of *each* single structural element” means simultaneous failure of ALL single structural elements must be considered, which is an unreasonable and unintended requirement. This should be changed to “failure of *any* single structural element,” similar to phrasing found in (c)(1).

**25.783(a)(4)** This “each” should be “any.” A source of power that can open *any* door needs to be removed, not just sources of power than can open every door.

**25.783(c)(2)** The “each single failure” should be “any single failure.”

**25.783(e)(1) & (e)(2)** These paragraphs have two issues. First, there can be multiple operator stations for a single door, and the indications should be made at all of them. Second, only indications of the status of the door associated with that operator’s station should be required; the conditions of other doors does not need to be indicated. Please consider the following alternate text:

25.783(e)(1) There must be a positive means to indicate at *each* door operator’s station that all required operations to close, latch, and lock *that* door have been completed.

25.783(e)(2) There must be a positive means clearly visible from *each* door operator’s station to indicate if *that* door is not fully closed, latched and locked for *any* door that could be a hazard if unlatched.

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