

Proposed Equivalent Safety Finding on Door Indications (not safe)

Applicable to B787

Introductory note:

The following Special Condition has been classified as an important Special Condition and as such shall be subject to public consultation, in accordance with EASA Management Board decision 02/04 dated 30 March 2004, 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

Through the B787 Certification exercise, compliance with NPA 25D-301 paragraph 25.783(e)(2) has been retained by Aviation Authorities.

This paragraph requirement states:

'There must be a positive means clearly visible from the operator station for each door to indicate if the door is not fully closed, latched and locked for each door that could be a hazard if unlatched.'

For the passenger entry doors Boeing has provided a positive means, a green light, to indicate if the door is fully closed, latched and locked. The 'unsecure' status of the door (not fully closed, latched and locked) is indicated by absence of this green light.

EASA considered that the Boeing design does not comply with the requirement, as the absence of an indication is not a positive indication means.

Boeing has therefore requested an Equivalent Safety Finding in respect of this.

B787 Equivalent Safety Finding D-28

- Doors Indication (not safe)-

Design Proposal :

Boeing proposes to utilize a green indication light located on the bottom of the Passenger Entrance Door (PED) window reveal that illuminates only when the door's closed/latched sensor and the locked sensor detect that the door is fully closed, latched, and locked.

If the sensors detect any other condition, that the door is not fully closed, latched, and locked, then the indication light remains off and does not illuminate.

Justification :

The existing design, consisting of illumination of a green locked light when the door is closed, latched, and locked, provides an increased level of safety. The locked light provides a positive indication of the required state for flight, at each PED. This is superior to an indication that illuminates if unlocked in that a failure in the locked light bulb or associated wiring defaults to a unsafe (not ready for flight) condition. Coupled with the trained cabin crew responsible for preparing each PED for flight, the existing design provides, at a minimum, an equivalent level of safety from the perspective of ensuring the door is secured prior to flight.

Furthermore, the PEDs provide a second important function. They are the emergency exits from the passenger cabin. During a time critical emergency evacuation, the added unlocked alert indication would trigger and this could cause a door operator to hesitate or stop continued rotation of the door handle. This could apply to both untrained passengers attempting to open the door for the first time and also trained cabin crew and rescue personnel. Since the unlocked alert indication would need to be visible in bright ambient light, it would be particularly pronounced during dark night time emergency lighting conditions. Considering the PED's critical function as emergency exits, the existing design provides an overall improved level of safety.

The locked light configuration is the result of careful consideration by the Boeing Company to implement a safe design that addresses both the use of the door as emergency exit and to ensure the door is closed, latched, and locked prior to flight. [...]

Safety Equivalency Demonstration:

The Boeing design does not directly comply with the requirement of CS25.783(e)(2) / NPA 25D-301 Issue 1, in regard to the provision of a positive indication when not fully closed, latched and locked.

The EASA does acknowledge that the advisory material associated to the rule can be interpreted differently, vis-à-vis the direct or indirect indication of the fully closed latched and locked status.

The EASA has reviewed the Boeing submissions for an ESF with regard to compliance with paragraph 25.783(e)(2), and considers that the presence of a "positive means" in the event of a completely secured door is not directly equivalent to the required alert in the case of an incompletely secured door.

Nevertheless, as the provided indication of a 'locked' door is absent in the event of an insecure door, an appropriately trained door operator should be able to deduce the status of the door. The training requirements for the door operator in this indication philosophy and the safety related procedures are therefore a major aspect of this subject and hence appropriate supporting instruction material must be provided.