

- (e) Equipment HIRF test level 3.
- (1) From 10 kHz to 400 MHz, use conducted susceptibility tests, starting at a minimum of 0.15 mA at 10 kHz, increasing 20 dB per frequency decade to a minimum of 7.5 mA at 500 kHz.
 - (2) From 500 kHz to 40 MHz, use conducted susceptibility tests at a minimum of 7.5 mA.
 - (3) From 40 to 400 MHz, use conducted susceptibility tests, starting at a minimum of 7.5 mA at 40 MHz, decreasing 20 dB per frequency decade to a minimum of 0.75 mA at 400 MHz.
 - (4) From 100 MHz to 8 GHz, use radiated susceptibility tests at a minimum of 5 V/m.

[Amdt 25/17]

APPENDIX S – AIRWORTHINESS REQUIREMENTS FOR NON-COMMERCIAL OPERATED AEROPLANES AND LOW-OCCUPANCY AEROPLANES

ED Decision 2017/015/R

(See AMC to Appendix S)

S25.1 General

ED Decision 2017/015/R

- (a) Applicability: unless otherwise specified within, the requirements of this Appendix are applicable to the passenger or crew compartments (interiors) of:
- (1) non-commercially operated aeroplanes with a passenger seating configuration of:
- (i) up to and including 19 passengers; or
- (ii) up to and including one half of the maximum passenger seating capacity of the type-certified aeroplane as indicated in the aeroplane type certificate data sheet (TCDS), provided that:
- (A) the total number of passengers approved for occupancy during taxiing, take-off or landing does not exceed 150 per deck; and
- (B) the total number of passengers approved for occupancy during taxiing, take-off or landing on a deck does also not exceed one half of the maximum passenger seating capacity for that deck as indicated in the aeroplane TCDS.
- (2) low-occupancy aeroplanes irrespective of the type of operations (commercial or non-commercial). A low-occupancy aeroplane is defined as an aeroplane which has a passenger seating configuration of:
- (i) up to and including 19; or
- (ii) up to and including one third of the maximum passenger seating capacity of the type-certified aeroplane as indicated in the aeroplane TCDS, provided that:
- (A) the total number of passenger seats approved for occupancy during taxiing, take-off, or landing does not exceed 100 per deck; and
- (B) the total number of passenger seats approved for occupancy during taxiing, take-off, or landing in any individual zone between pairs of emergency exits (or any dead end zone) does also not exceed one-third of the sum of the passenger seat allowances for the emergency exit pairs bounding that zone, using the passenger seat allowance for each emergency exit pair as defined by the applicable certification basis of the aeroplane. For the purpose of determining compliance with this zonal limitation, in the case of an aeroplane which has deactivated emergency exits, it shall be assumed that all emergency exits are functional.

- (b) Aeroplane Flight Manual (AFM) Limitation: if compliance with any part of this Appendix limits the aeroplane to non-commercial operations, this limitation must be included in the 'Limitations' Section of the AFM.

[Amdt 25/19]

AMC to Appendix S, S25.1 Passenger seating configuration

ED Decision 2017/015/R

Where this term is used in Appendix S:

'Passenger seating configuration' means the passenger seating capacity established during the certification process (either type certificate (TC), supplemental type certificate (STC) or change to the TC or STC, as relevant), conducted for the particular cabin interior and emergency exit arrangement of the aeroplane considered.

The passenger seating configuration is equal to, or less than, the maximum passenger seating capacity of the relevant type-certified aeroplane as indicated in the aeroplane type certificate data sheet (TCDS).

The passenger seating configuration may be less than the total number of passenger seats in the aeroplane that are approved for occupancy during taxiing, take-off, and landing, if seats in excess are installed; in such a case the requirement [S25.40\(c\)](#) Seats in Excess must be complied with.

[Amdt 25/19]

S25.10 General Cabin Arrangement

ED Decision 2017/015/R

- (a) Interior Doors on Non-Commercially Operated Aeroplanes (See [AMC to Appendix S, S25.10\(a\)](#)): For a non-commercially operated aeroplane, installation of doors that results in non-compliance with [CS 25.813\(e\)](#) is acceptable provided that it is ensured by design and procedure that:
- (1) each door is open before entering any of the taxiing, take-off, and landing phases;
 - (2) each door remains open during taxiing, take-off, and landing, and especially during and after a crash landing; and
 - (3) in the case of any probable failure or jamming of a door in a position other than fully open, any occupant is able, from any compartment separated by that door, to restore in an easy and simple manner a sufficient opening to access the compartment on the other side of the door.
- (b) Interior Doors on Commercially Operated Aeroplanes (See [AMC to Appendix S, S25.10\(b\)](#)): For a low-occupancy aeroplane having a passenger seating configuration of 19 or less, installation of doors that results in non-compliance with [CS 25.813\(e\)](#) is acceptable provided that the conditions of S25.10(a)(1), S25.10(a)(2) and S25.10(a)(3) are complied with and the following additional requirements are met for each passenger compartment created by a door or doors:
- (1) Within the compartment, there is at least one emergency exit above the waterline on each side of the fuselage that meets at least the requirements of a type IV emergency exit for a compartment that has a passenger seating configuration of nine seats or less, or of a type III emergency exit otherwise; or

- (2) Within the compartment, there is at least one emergency exit above the waterline on one side of the fuselage that meets at least the requirements of a type IV emergency exit for a compartment that has a passenger seating configuration of nine seats or less, or of a type III emergency exit otherwise, and:
- (i) an occupant of the compartment would not need to go through more than one door to access an emergency exit above the waterline on the other side of the fuselage; and
 - (ii) the demonstration of compliance with the provisions S25.10(a)(1) and (2) does not rely on any passenger action, nor involve any flight crew member leaving their position in the cockpit.
- (c) Isolated Compartments: each cabin compartment isolated from the rest of the cabin such that a fire starting in the compartment would not be directly and quickly detected by the occupants of another compartment, in an aeroplane that has a passenger seating configuration of 20 or more, or which has a cabin length of more than 18.29 m (60 ft), must be equipped with a smoke/fire detection system or equivalent which allows detection within one minute after the start of a fire and provides a visual indication in the cockpit, or a visual indication or audible warning in the passenger cabin that would be readily detected by a cabin crew member. However, if it can be demonstrated that a fire would be directly and quickly detected because the compartment is likely to be occupied for the majority of the flight time, such a system is not required (See [AMC to Appendix S, S25.10\(c\)](#)).
- (d) Deactivation of existing Emergency Exits: Deactivation of one or more emergency exits that results in non-compliance with [CS 25.807\(e\)](#) is acceptable, provided that compliance with the following requirements is shown (See [AMC to Appendix S, S25.10\(d\) and \(e\)](#)):
- (1) the number of passenger seats allowed in a zone between two remaining adjacent pairs of emergency exits is limited to one half of the combined rated capacity of the two pairs of emergency exits (rounded to the nearest whole number);
 - (2) the number of passenger seats allowed in a zone with only one remaining pair of emergency exits at one end (a so called dead end zone) is limited to one half of the rated capacity of the pair of emergency exits (rounded to the nearest whole number); and
 - (3) the distance from each passenger seat to at least one remaining emergency exit, on each side of the fuselage, remains compatible with easy egress from the aeroplane.
- (e) Distance between Emergency Exits: deactivation of emergency exits which results in non-compliance with CS 25.807(f)(4) is acceptable on non-commercially operated aeroplanes only, provided that:
- (1) compliance with S25.10(d) is shown; and
 - (2) a distance of more than 18.29 m (60 ft) between adjacent remaining emergency exits is created only once per side of the fuselage on each deck (See [AMC to Appendix S, S25.10\(d\) and \(e\)](#)).

[Amendt 25/19]

AMC to Appendix S, S25.10(a) Interior Doors on Non-Commercially Operated Aeroplanes

ED Decision 2017/015/R

- (1) The following provides acceptable means to ensure that a door is open before entering any of the taxiing, take-off, and landing phase, as required by [S25.10\(a\)\(1\)](#):
 - (a) The door should be conspicuously placarded on both sides to be in the safe (i.e. open and secured) position during taxiing, take-off, and landing;
 - (b) The operation of the door and the requirement that the door be secured open for taxiing, take-off, and landing must be the subject of a passenger briefing, and the requirement for this briefing must be part of the AFM; for the purpose of this briefing, a description of the operation of the internal door should be made available to the flight crew; and
 - (c) There should be a means to signal to the flight crew in a timely manner if the door is not open and secured in a safe position before entering any of the taxiing, take-off, or landing phases. The indication should be triggered during the descent phase, early enough to enable the flight crew to take appropriate action before entering the approach phase, unless the aeroplane is required to have at least one cabin crew member on board. Appropriate procedures for crew action should be established.
- (2) The following provides acceptable means to ensure that the door remains open during taxiing, take-off, and landing, and especially during and after a crash landing, as required by [S25.10\(a\)\(2\)](#):
 - (a) Dual means should be provided to secure the door in the open position for taxiing, take-off, and landing. Each of those dual means should be capable of reacting to the inertia loads specified in [CS 25.561](#); and
 - (b) The indication to the flight crew mentioned in the above condition (1)(c) should be triggered without delay and remain active whenever the door is not in the safe position during any of the taxiing, take-off, and landing flight phases. Appropriate procedures for crew action should be established.
- (3) Regarding the indication mentioned in the above paragraphs (1)(c) and (2)(b), if several interior doors are installed, it might not be necessary to provide a distinct indication for each door on the flight deck. Door position indication in the cockpit may be achieved by means of a single visual indication serving all interior doors installed in the aeroplane, provided that at least one of the following two conditions is met:
 - (a) The number and location of the interior doors is such that quick identification of the incorrectly positioned door can be made by cabin occupants. A cabin layout which may be accepted as meeting this condition may be one in which all interior doors can be easily viewed during a direct walk from the front to the rear of the cabin.
 - (b) There is a simultaneous indication provided to a required cabin crew member which allows easy identification of the interior door in the incorrect position. An associated procedure for coordination between the flight and cabin crew should be included in the AFM.

- (4) The following provides acceptable means to comply with the requirement [S25.10\(a\)\(3\)](#):
- (a) In case the door is operated (opening, closing and/or latching) manually: the door should be easily operable from both sides, and if a latch is installed to restrain the door in the closed position, the door should be capable of being unlatched from both sides without the aid of any tool and without the need of any item (it is not acceptable to require the use of even common items such as coins, credit cards, pens, etc.);
 - (b) In case the door is operated (opening, closing and/or latching) electrically: there should be a manual override that satisfies the above condition (4)(a), unless the electrical opening and retention in the open and secured position continues to function following complete loss of normal electrical power, and it is demonstrated that following any probable electrical failure, the door defaults to the fully open and secured position;
 - (c) The door should be frangible (or equivalent, e.g. it has a removable panel) in both directions. An assessment should be made of the moveable cabin features adjacent to the door in order to ensure that sufficient clearance on each side of the door, during all phases of flight, is assured by design such that the frangibility feature(s) will work as intended. Alternatively, it may be shown that, irrespective of the positioning of moveable cabin features, the overall frangibility objective is still achieved, e.g. by reaching through a reduced opening to easily move the feature before finishing the actions needed to provide the full opening intended. The frangibility should be demonstrated by test using a 5th percentile female, and the resulting aperture should be demonstrated to be large enough for a 95th percentile male to escape. The case of probable jamming in a non-fully closed position should be considered;
 - (d) As an alternative to the above mentioned frangibility feature, it may be demonstrated, for example with double sliding doors, that following any probable failure or jamming of the door, a sufficient opening is still ensured that allows for passing through the doorway; 'sufficient opening' would mean, in the case of a sliding door, an opening from floor to ceiling consistent with the minimum required width of aisle as prescribed by [CS 25.815](#) for a passenger seating capacity equal to the maximum expected number of passengers that would need to evacuate through the passenger egress path crossed by the door.
 - (e) The pre-flight passenger briefing (as mentioned in condition (1)(b)) should contain instructions on how to restore a sufficient opening for evacuation (frangibility feature or alternative means) in case of failure or jamming of the door.

For the definition of 'probable failure or jamming of the door', refer to the definition of 'Probable Failure Conditions' in [AMC 25.1309](#).

[Amdt 25/19]

AMC to Appendix S, S25.10(b) Interior Doors on Commercially Operated Aeroplanes

ED Decision 2017/015/R

In the case of an aeroplane which is not intended to be limited to non-commercial operations, the familiarity of the occupants with the specific cabin features of the aeroplane cannot be credited in the demonstration that, in the case of any probable failure or jamming of the door in a position other than fully open, any occupant is able, from any compartment separated by that door, to restore in an easy and simple manner a sufficient opening to access the compartment on the other side of the door (compliance with the condition [S25.10\(a\)\(3\)](#)); this means, for instance, that when the demonstration relies on the frangibility of the door, there should be a placard on each side of the door to indicate the presence and functioning of this feature.

The requirement S25.10(b)(2)(ii) states that ‘the demonstration of compliance against the provision S25.10(a)(1) and (2) shall not rely on any passenger action, nor involve any flight crew member leaving their position in the cockpit’. Any of the following solutions may be employed to meet this requirement:

- (1) An automatic system, for the opening of the door and retention of the door in the open and secured position.
- (2) A control in the cockpit, compliant with [CS 25.777](#), to activate remotely the opening of the door and retention of the door in the open and secured position.
- (3) For aeroplanes required to have at least one cabin crew member on board, and the cabin crew is clearly tasked with ensuring that the door is open before entering any of the taxiing, take-off, and landing phases. Appropriate cabin crew procedures and cabin crew training should be established.

[Amdt 25/19]

AMC to Appendix S, S25.10(c) Isolated Compartments

ED Decision 2017/015/R

- (1) Cabin Compartments

- (a) Compartments to be considered as isolated

Compartments in an aeroplane with an approved passenger capacity of less than 20 and a cabin length of 18.29 m (60 ft) or less do not need, in any case, to be considered as isolated. AMC 25.854 provides guidance on how to determine the cabin length.

S25.10(c) requires that a compartment in which a fire would not be directly or would not be quickly detected by occupants of another compartment must meet additional criteria in order to provide confidence that a fire will be detected. Such a compartment is described as an isolated compartment.

Any compartment that can be occupied by crew members and/or passengers during flight (other than accessible cargo/baggage compartments) should be considered as isolated for the purposes of showing compliance to S25.10(c) if it cannot be assured that fire/smoke in the compartment will be quickly detected by occupants of other occupied compartments of the aeroplane due to rapid smoke/fumes transmission enabled by the design of the aeroplane.

The assurance that fire/smoke will be quickly detected by occupants of other occupied compartments in the aeroplane may be provided by obvious smoke/fumes passage features, e.g. grills/louvres in a door, or via the aeroplane's environmental control system air recirculation characteristics. Substantiation of the effectiveness of such declared smoke/fumes transmission means, via ground and/or flight tests, may be required. Detection of fire/smoke by occupants of another compartment only will provide the required assurance if there is confidence that this other compartment in question will be occupied, and not by sleeping persons (i.e. it is a compartment that meets the conditions set out in paragraph (1)(b)(ii) below). Thus, if smoke/fumes transmission is relied upon for compliance, the occupancy conditions of the aeroplane as a whole need to be taken into account.

(b) Isolated compartments occupied for the majority of the flight time

S25.10(c) exempts isolated compartments (as described in paragraph (a) above) that are occupied for the majority of the flight time from being equipped with a smoke/fire detection system, based on the assumption that the occupants will quickly detect the fire.

- (i) However, some categories of isolated compartments will by their nature not be eligible for this approach, either because there is a risk that all occupants will be sleeping (sleeping persons will not be able to detect a fire starting in the isolated compartment), or because occupancy for the majority of the flight time cannot be realistically assessed. Examples include, but are not limited to, the following:
 - (A) bedrooms, (i.e. rooms containing any sleeping installations intended to provide a high level of sleeping comfort, such as beds, or berthable divans, even if they also contain seats that can be occupied during taxiing, take-off, and landing; however, passenger seats do not need to be considered as sleeping installations in this context);
 - (B) specialised rooms for which permanent occupation during the flight is unlikely (examples would include smoking rooms, cinema rooms, etc.);
 - (C) washrooms/bathrooms, although the intent of S25.10(c) will be met in any case, if they are compliant with CS 25.854; however, a shower cubicle does not need to be considered an isolated compartment;
 - (D) crew rest compartments; and
 - (E) galley compartments.
- (ii) On the other hand, an isolated compartment, unless meeting one of the criteria in (i) above, will be accepted as being occupied for at least the majority of the flight time, thus providing for smoke/fire detection by the occupants, if any of the following conditions are met:
 - (A) it is the flight crew compartment
 - (B) all required cabin crew seats are located in the isolated compartment;
 - (C) the isolated compartment contains a crew station that due to its specialised purpose, is likely to be occupied for the majority of the flight time;
 - (D) the number of seats in the isolated compartment (including cabin attendant seats and seats in excess) approved for occupancy during taxiing, take-off,

and landing is at least equal to the number indicated in the right hand column of the table below.

Total number of passenger seats installed on the aeroplane approved for occupancy during taxiing, take-off, and landing (including seats in excess)	An isolated compartment is accepted as being occupied for the majority of the flight time if it contains at least the following number of seats approved for occupancy during taxiing, take-off, and landing
Up to 19	2
20–23	3
24–29	4
30–36	5
37–43	6
44–49	7
50–56	8
57–63	9
64 and above	10

Note: the ‘Up to 19’ figure is included for the case of an aeroplane with a total cabin length in excess of 18.29 m (60 ft).

- (iii) In addition, an isolated compartment featuring no seat and no stowage (e.g. a connecting corridor) might be accepted as being an isolated compartment without a smoke/fire detection system, because of the low likelihood of a fire starting in such a compartment.

(c) Minimum requirements for compartments

For all compartments, irrespective of whether or not they are required to have a smoke/fire detection system installed:

- (i) For accessibility and firefighting purposes, sufficient lighting in the compartment should be provided. For compartments that could be dark during flight, a means should be provided to enable a person entering the compartment to readily gain visibility of the interior. Such means may be:
 - (A) a conveniently located, easy to find and use lighting control for the compartment;
 - (B) a flashlight within close proximity to the entrance of the compartment; or
 - (C) automatic illumination in the event the smoke/fire detection system in the compartment (if installed) triggers.
- (ii) At least one readily accessible handheld fire extinguisher should be available for use in each compartment. Fire extinguishers required by CS 25.851(a) may be used for this purpose. On the other hand this may also lead to the need to install more fire extinguishers than the minimum required by CS 25.851(a).
- (iii) Portable breathing equipment, required by CS 25.1439(a), should be located close to the handheld fire extinguisher.

(b) Smoke/fire detection in isolated compartments

For interiors with more than one isolated compartment, there should be means by which flight or cabin crew can readily identify in which compartment smoke/fire has been detected. Depending on the number of isolated compartments and the specific layout, such means might be simply moving through the cabin and checking each compartment (in the case that cabin crew are required to be on board) or might need to be a visual indication outside each compartment, or some form of annunciator panel available to an appropriate crew member. The objective in any case is that correct identification of the location of the smoke/fire should be possible without unnecessary delay.

If the isolated compartment incorporates a stowage compartment of a volume greater than 0.7 m³ (25 ft³), this stowage compartment should be itself equipped with a smoke detector, unless it can be demonstrated that smoke from within the stowage compartment will be detected by the detector of the isolated compartment in which the stowage compartment is located (e.g. through grilles in the stowage door), and within the time specified in the requirement S25.10(c).

If the isolated compartment incorporates a galley, or if smoking is to be allowed in the isolated compartment, nuisance triggering of the smoke/fire detection system may be minimised by a design feature that provides for temporary system deactivation by an occupant (passenger or crew member). In that case, full reactivation should be automatic after a time period of no longer than 10 minutes following the last deactivation action.

The effectiveness of the smoke/fire detection system should be demonstrated for all approved operating configurations and conditions. For smoke detection demonstration, FAA AC 25-9A, Smoke detection, penetration, and evacuation tests and related flight manual emergency procedures, 6 January 1994 provides acceptable means of compliance.

During testing, it should be demonstrated that no inadvertent operation of smoke/fire detectors in any compartment would occur as a result of fire starting in any other compartment.

An assessment of the compartment design and observations during smoke/fire detection tests will be expected in order to provide a demonstration of the effectiveness of firefighting procedures. This should also include demonstrating that the compartment is provided with sufficient access in flight to enable a crew member to effectively reach any part with the contents of a handheld fire extinguisher.

[Amdt 25/19]